

“ONLY A FEW SECONDS” YOUNG CHILDREN DROWN WITHOUT A SOUND

SUMMARY

“This is truth the poet sings,
That a sorrow’s crown of sorrow is remembering happier things” (Tennyson)

Year in and year out, drowning is the leading cause of accidental death in the 1–4 age group in Orange County, usually exceeding even motor vehicle related deaths. Some survivors of immersion (near drowning) incidents have permanent neurological impairment.



Photo courtesy Care Ambulance Service, Inc.

There is no uniform drowning/immersion incident reporting form for all jurisdictions within Orange County. This, as well as small numbers, hampers accurate determination of causes and outcomes. It is hoped that better understanding of causation will lead to ever more effective prevention strategies.

The Grand Jury recommends that compliance with current pool safety requirements should be mandated upon the sale, rental or lease of a home with a pool/spa. A systematic method of enforcement for private residential safety features similar to enforcement of public pool/spa safety requirements should be devised. Door exit alarms should no longer be allowed as an exception to the provision of specified barriers.

Child endangerment, as an issue, was addressed.

Strategies designed to significantly reduce the incidence of drowning/immersion events among children ages 1-4 in Orange County were recommended. These fall into several categories including improved data collection and analysis, prevention both passive and active, public education/awareness and code enforcement.

There are more than 100,000 private residential swimming pools in Orange County. The joy of family pool ownership becomes the site of family tragedy in the time it takes to answer the phone. Young children drown without a sound.

PURPOSE/INTRODUCTION

The purpose of this study was to address issues dealing with drowning and near drowning (immersion) incidents involving young children that occur in private residential pools/spas. The Grand Jury recommended strategies to the Health Care Agency, the Planning and Development Services Department and the Fire Authority that were designed to prevent these tragic outcomes.

HISTORY/BACKGROUND

The leading cause of accidental death in the 1-4 age group in Orange County is drowning, usually exceeding even motor vehicle related deaths. During the last seven years there appears to be a downward trend in the number of drowning deaths in Orange County. However, the reduction has not been dramatic.

The vast majority of age 1-4 drowning deaths in Orange County are preventable; 80% occur in private residential pools/spas while the other 20% occur in a variety of bodies of water from as small as a bucket to as large as the Pacific Ocean. "Furthermore, death is just one outcome of water-related incidents: in about 9% of incidents, the child survives, but with some degree of neurological impairment."¹

California residents may own, build or rent a home with or without a pool/spa. Those who occupy a home with a pool/spa must ensure the safety of all who are exposed to the risk of drowning. How can this obligation be met?

County of Orange Current Pool/Spa Safety Features

In the Spring of 1999, the California Building Code, Appendix Chapter 4, SPECIAL USE AND OCCUPANCY, Division I – Barriers for Swimming Pools, Spas and Hot Tubs, § 419.1 – 421.3, was adopted by the Board of Supervisors as the County of Orange Ordinance Number 99-10, which applies to unincorporated areas.

The pool shall be provided with a barrier that is at least 48 inches high (BARRIER is defined in the Ordinance and specifications are detailed for types of barriers and access gates). Spas and Hot Tubs must comply unless equipped with a listed (approved) safety cover.

Exceptions:

1. Self-closing and self-latching devices installed on all doors with direct access to the pool with the release mechanism placed no lower than 54 inches above the floor.
2. A door exit alarm.
3. Other means of protection that are at least as effective as the devices required in the Ordinance.

Any one of the above Provisions and Exceptions meets the legal requirement. Unless a complaint is registered, County enforcement of its pool safety ordinance occurs only at the time of final inspection of a newly constructed pool/spa. There is no systematic enforcement of the requirements thereafter. Even if ownership or occupancy changes, pools/spas built prior to Winter 1996 are not required to comply with current safety requirements.

The Grand Jury learned that many residential pool owners choose the least expensive of the safety features—exit alarms; however, the intrusive sound can be very annoying. As a result, some pool owners disable the alarm by removing the battery, thus negating the sole safety feature.

Existing pool/spa safety features in the County unincorporated area can be further improved as follows:

- ? Eliminate the exception that allows a door exit alarm as the **only** safety feature choice
- ? Require compliance with current safety features upon sale or lease of a home
- ? Systematic enforcement of the residential pool safety ordinance on an ongoing basis

Enforcement

Only permit applications or complaints of violations trigger single-family residential pool code enforcement by the County Planning and Development Services Department. After final inspection, private pools on the property of a single-family residence are not monitored. If a complaint is registered, the homeowner may be cited; but the County does not systematically enforce its pool safety ordinance on an ongoing basis.

A marked contrast in enforcement of pool safety requirements exists between private and non-private pools/spas, such as apartments, homeowner's associations and swim schools. The Environmental Health Division of the Orange County Health Care Agency

visits non-private pools/spas approximately three times annually and has Countywide jurisdiction to inspect for health and safety violations.

Supervision

Problems involving inadequate or the absence of exterior barriers account for a significant number of drowning/immersion incidents. Lack of supervision, including inattention and distraction, is another major cause of these incidents.

A number of approaches have been tried to improve supervision. One of these is a designated “water watcher” whose responsibility it is to carefully monitor a pool/spa. This person, usually a family member, consents and is designated “water watcher” until relieved. She/he devotes full attention to the pool/spa to ensure the safety of those in the water.

Public Awareness/Education

Publicity and public education are known to reduce the number of drowning/immersion incidents. The Drowning Prevention Network, which meets at Children’s Hospital of Orange County (CHOC) spearheads these efforts in the County. The Orange County Fire Authority and the Health Care Agency, as well as most city fire departments, have water safety outreach programs that have multiple components. Fire departments in Orange County provide a variety of informative written materials. A pamphlet ostensibly for five-year-olds is cleverly designed to impart knowledge to parents as they read to their child. Numerous other sources provide similar materials. Media events, which acquaint the public with pool/spa safety issues, are scheduled two to four times a year.

The Los Angeles Times is a partner in Orange County drowning prevention efforts; but there is no comparable regional television partner. Television is the 1000-pound gorilla of the media and is the most effective way to get out the message that drowning is preventable. Orange County is the stepchild of the dominant Los Angeles based television stations. Rather than limiting public education efforts to Orange County, regionalization would provide a forum for broader and more frequent coverage of the message. A drowning prevention message directed to the much larger regional television audience would justify increased coverage by broadcast stations.

The National Safe Kids Campaign and the American Academy of Pediatrics, among others, have assumed leadership roles nationally. In spite of these efforts, at least one study² documents a lack of awareness among many pediatricians that drowning is the leading cause of accidental death in the 1–4 age group. This highlights the need for professional as well as public education.

Data Collection

Meaningful data collection and analysis are imperative in order to assess the effectiveness of prevention strategies. Even though drowning is the leading cause of accidental death among children ages 1-4 in Orange County, the number of incidents is small and, therefore, statistical analysis is difficult. If data were collected on a regional basis, it is more likely that incident numbers would be large enough to reach statistical significance. Collection and analysis of nonfatal immersion data are also necessary.

Until recently, there was no systematic attempt to establish uniform data collection methods for recording drowning/immersion incidents in Orange County. A 1991–1992 Orange County Health Care Agency study is an exception³, enabled by adequate funding which allowed detailed incident reporting, follow-up and analysis. Because of a lack of continued funding, the same level of detailed incident reporting, follow-up and analysis has not been possible. Less complete 1996 data was analyzed in a report distributed by the Health Care Agency in 1999⁴. The Health Care Agency plans to distribute a similar report for years 1997 and 1998 later this year (2001).

The Orange County Fire Authority (OCFA) has initiated a computer-based incident reporting form for use within its jurisdictions that is easy to distribute via e-mail.

The Sheriff-Coroner Department maintains a database of drowning deaths. This data consists of the site of a drowning and the age of the person who died. For the data to be meaningful, calculations should include the number of deaths in ratio to the total number of children in the age group or total number of residential pool/spas. Data sources are available and accessible to enable rate calculations. The Center for Demographic Research at California State University, Fullerton is a source of population data. The Orange County Assessor Department maintains a current database of pools/spas including their locations. Rates could be calculated in at least two ways:

- ? Drowning deaths per 100,000 children in the age group under study
- ? Drowning deaths in the age group under study per 100,000 private residential pools/spas in the area under study

Keeping track of a child with permanent neurological impairment – a possible long-term outcome of an immersion event – is difficult because the information is not readily accessible.

Child Endangerment

Why has the impact of the swimming pool safety laws been less than dramatic while, in contrast, motor vehicle safety measures, seat belts and car seats along with strict enforcement, have reduced motor vehicle related injuries and deaths dramatically?

In Southern California, where motor vehicle operation and ownership are near necessities, motor vehicles must be registered and owners licensed. Seat belts, or other appropriate restraints, are required for all occupants including small children. Police officers enforce these safety restraint requirements. When a child is injured or dies as a result of failure to adhere to restraint laws, the driver may be charged with felony child endangerment if circumstances so dictate.

Private pool/spa ownership is optional and unnecessary for a happy, fulfilling life and should be considered a luxury. As previously noted, the County of Orange Ordinance Number 99-10 specifies pool/spa safety requirements. Once the pool/spa is in place and has met the Ordinance's requirements, as verified by an on-site inspection, there is no follow-up unless an incident is reported or a complaint is registered. Should the County require licensing of private single-family pool/spa owners? If so, should there be associated fees to support enforcement of barrier laws? Even in the absence of licensing and registration, pool/spa safety inspections could be carried out at least on a voluntary basis.

If a child drowns as a result of inadequate supervision or failure to maintain compliance with barrier requirements, child endangerment statutes allow for criminal prosecution. In Orange County, prosecution is rarely pursued because even though negligence may be at issue, it is nearly always *ordinary* as opposed to *criminal* negligence. Since jurors are likely to view the loss of a child as the most severe possible punishment, conviction is very unlikely. Civil liability actions are also uncommon because the responsible person is most often a parent, grandparent or other close family member.

What has been done elsewhere?

The City of Phoenix, Arizona, including the surrounding region, is considered by many as a model for drowning prevention efforts. During the 1980's, the large number of drowning incidents occurring in the area captured the attention of the local populace. A multifaceted prevention program was put in place that included highly effective broadcast media efforts. The Arizona State Legislature enacted a strong pool/spa safety ordinance that did not allow door exit alarms to substitute for more effective barriers. If ownership or occupancy of a residence changed, all features of the current ordinance must be met. Data collection and analysis were among the priorities. The Drowning Prevention Coalition of Central Arizona provided leadership. Over the past decade, a reported 50% reduction in drowning/immersion incidents is attributed to the efforts of community leaders and the local broadcast media. In Orange County, efforts of the Drowning Prevention Network, the City of Irvine and others have been based, in part, on the Arizona model.

Future Programs

The Children and Families Commission of Orange County has funded the Systematic Childhood Injury Prevention Program (SCIPP) which is a three-year

project focusing on reduction of death and disability from injury to Orange County children 0-5 years of age.⁵ Building on the recently awarded SCIPP funding, the Injury Prevention Collaborative (IPC) was established to enhance existing programs and develop new initiatives aimed at reducing preventable death and disability from injury to Orange County children and their families.⁶

Discussion

What meaningful additional steps could be taken to further reduce drowning/immersion incidents? One approach suggested by the OCFA involves recruitment of a cadre of volunteers who would contact owners or occupants of residences with a pool/spa to offer a voluntary inspection and to provide continuous safety education.

The Orange County Health Care Agency in coordination with the Children and Families Commission, as a part of their overall injury prevention efforts, should assume a leadership role that promotes pool safety awareness among children's health care providers, such as pediatricians, family physicians, nurse practitioners and health educators. These care providers could, in turn, make a greater effort to educate parents concerning water safety for toddlers.

GIS (Geographic Information System) technology exists that could be used to map the locations of all residential pools/spas in Orange County, and specifically locate these residences for purposes of education and awareness as well as enforcement of safety ordinances.

METHOD OF STUDY

The Grand Jury visited the Orange County Fire Authority (OCFA) Administration Center to view their computerized incident reporting form and attended meetings of the Drowning Prevention Network at Children's Hospital of Orange County (CHOC).

Interviews were conducted with representatives of the Drowning Prevention Network, the U.S. Consumer Product Safety Commission, OCFA, Anaheim Fire Department, various Orange County agencies, Cities of Garden Grove, Anaheim and Irvine, California Department of Health Services and various Arizona state and local agencies.

Materials were reviewed from CHOC, OCFA, Anaheim Fire Department, OC Sheriff-Coroner's Office, California Department of Health Services, California State University, Fullerton, The California Center for Health Improvement, The Orange County 2001 Community Indicators, The Swimming Pool Safety Act and published medical literature.

FINDINGS

Under California Penal Code § 933 and § 933.05, responses are required to all findings. The 2000–2001 Orange County Grand Jury has arrived at the following nine findings:

1. The County of Orange Ordinance Number 99–10, which applies only to new construction, deals with barriers for swimming pools, spas and hot tubs and does not apply to private residential pools/spas completed prior to the Winter of 1996.
2. One of the exceptions to Ordinance Number 99–10 (above) allows a door exit alarm to satisfy the barrier requirement. Door exit alarms are easily disabled.
3. Within Orange County jurisdictions, drowning/immersion reports submitted to the County Health Care Agency from which to extract data to determine causes and outcomes are not uniform in format.
4. While drowning is the leading cause of accidental death among children ages 1-4 in Orange County, because incident numbers are small, it is difficult to achieve statistically significant results when analyzing causation and outcomes.
5. Members of the Drowning Prevention Network, including representatives of the Health Care Agency and the Orange County Fire Authority, have done an excellent job of informing the Orange County public. However, there is no regional drowning/immersion prevention organization or authority to take advantage of the Southern California television broadcast area that would maximize coverage of the public education/awareness message.
6. After verification of minimum standards compliance at the final inspection of a new single-family residential pool/spa by the Planning and Development Services Department there is no further ongoing inspection and enforcement of pool/spa safety features.
7. The Orange County Fire Authority has developed and implemented a computer-based reporting form for drowning/immersion incidents.
8. The County has recently utilized GIS (Geographic Information System) technology. This could be used to map the locations of all residential pools/spas in Orange County.
9. The Orange County District Attorney usually does not prosecute drowning/immersion incidents, which typically involve *ordinary* negligence rather than *criminal* negligence.

Responses to Findings 1, 2, 3, 4, 5, 6 and 8 are required from the Orange County Board of Supervisors.

A Response to Finding 4 is required from the Children and Families Commission.

Responses to Findings 6, 7 and 8 are required from the-Orange County Fire Authority.

A Response to Finding 9 is required from the District Attorney.

Responses to Findings 1 and 2 are requested from the Planning and Development Services Department.

Responses to Findings 3, 4, 5, 6 and 8 are requested from the Orange County Health Care Agency.

RECOMMENDATIONS

In accordance with California Penal code § 933 and § 933.05, each recommendation requires a response from the government entity to which it is addressed. These responses are submitted to the Presiding Judge of the Superior court. Based upon the findings, the 2000–2001 Orange County Grand Jury recommends that:

1. The Orange County Board of Supervisors should amend and add a provision to the County of Orange Ordinance Number 99-10 to apply retroactively upon the sale, rental or lease of a residence with a pool/spa and should encourage all of the cities within Orange County to enact similar provisions to their pool/spa codes. (Finding 1)
2. The Orange County Board of Supervisors should eliminate the exception that allows a **door exit alarm** to satisfy the barrier requirements of Ordinance Number 99-10 and encourage all of the cities within Orange County to eliminate similar provisions from their pool/spa codes. (Finding 2)
3. The Orange County Health Care Agency and the Orange County Fire Authority should undertake a coordinated effort to establish a computerized uniform database to enable analysis similar to that used in the Health Care Agency Immersion and Surveillance Survey 1991 and 1992. (Findings 3, 4 and 7)
4. The Orange County Board of Supervisors should establish a regional coalition to include representatives from contiguous Southern California Counties for coordination of all aspects of drowning/immersion incident prevention. (Finding 5)
5. The Orange County Board of Supervisors should consider devising a means for ongoing systematic enforcement of the County of Orange Ordinance Number 99-10 for private residential pools/spas and encourage all the cities within the County to enact similar provisions for their pool/spa codes. (Finding 6)

6. The County and the Orange County Fire Authority should use available GIS technology to map locations of all residential pools/spas for ongoing enforcement of the County's pool/spa safety ordinance and encourage a coordinated effort to include all cities within the County. (Finding 8)

Responses to all Recommendations are required from the Orange County Board of Supervisors.

Responses to Recommendations 3 and 5 are required from the Orange County Fire Authority.

Responses to Recommendations 3 and 6 are requested from the Orange County Health Care Agency.

COMMENDATIONS

The Orange County Grand Jury commends the following for their drowning prevention efforts:

- ? The Drowning Prevention Network of Orange County
- ? The Orange County Fire Authority
- ? The Orange County Health Care Agency

The Orange County Grand Jury commends the Orange County Children and Families Commission for funding the Systematic Injury Prevention Program (SCIPP) and the Injury Prevention Collaborative (ICP).⁷

APPENDIX

Orange County Fire Authority

Orange County Assessor Department

Orange County Sheriff-Coroner

The Center for Demographic Research California State University, Fullerton

Orange County Health Care Agency

The Drowning Prevention Network of Orange County

City of Irvine Community Development Department, Building and Safety Division

- ? Original Swimming Pool Ordinance from 1979
- ? Swimming Pool Ordinance (current)

City of Garden Grove Building Services Division

City of Anaheim Building Division

Orange County Planning and Development Services Department

Orange County Ordinance Number 99–10

Anaheim Fire Department, Community Relations Section

“Safety Barrier Guidelines for Home Pools”, The United States Consumer Products Safety Commission

Children’s Hospital of Orange County-Community Education

City of Phoenix Development Services Department

Arizona Department of Health Services, Bureau of Public Health Statistics

Drowning Prevention Coalition of Central Arizona

Phoenix Fire Department

Epidemiology and Prevention for Injury Control Branch of Prevention Services of the California Department of Health Services

Injury Surveillance and Epidemiology Section of the California Department of Health Services

2001 Orange County Community Indicators Report

California Center for Health Improvement

The Swimming Pool Safety Act, Health and Safety Code, Article 2.5

¹ Water Related Incidents in 1998 in Maricopa County,
A Report to the Drowning Prevention Coalition of Central Arizona
Arizona Department of Health Services
July 1999
Epidemiologic Report Number 1999:2

² Barkin, S. and Gelberg, L.
Sink or swim - - clinicians don't often counsel on drowning prevention
Pediatrics 1999 Nov; 104 (5 Pt 2): 1217-19

³ Meyers, Hildy M.D., M.P.H., Amy Dale, M.P.H., Sheryll Bolton, R.N., B.S.
Immersion and Surveillance Summary 1991 and 1992
Childhood Injury Prevention Program County of Orange Health Care Agency/Public Health, April 1993

⁴ *Monitoring Injuries in Orange County*
A Report Based on Injury Deaths and Hospitalizations in 1996
Mark B. Horton. MD, MSPH, Director of Public Health/Health Officer

Ron LaPorte, Division Manager, Health Promotion and Disease Control
Amy Dale, MPH, Program Manager, Health Promotion
Bob Olson, Ph.D., MPH, Program Supervisor, Chronic Disease and Injury Prevention Program
Prepared by:
Sharon Thayer, MPH, Epidemiologist, Chronic Disease and Injury Prevention Program
Jennifer Kraft, MPH, Health Educator, Chronic Disease and Injury Prevention Program

⁵ Letter from American Academy of Pediatrics
California Chapter 4
Executive Director: Deborah Monfea
Executive Director of SCIPP: Phyllis Agran, M.D.
Co-executive Directors of the Injury Prevention Collaborative: Alberto Gedissman, M.D AND Phyllis Agran, M.D.
RE: Orange County Children and Families Grants

⁶ Ibid.

⁷ Ibid