

**ESTABLISHING THE NEED FOR “STOP, DROP AND ROLL”
IN THE EAST VALLEY FIRE DEPARTMENT**

Leading Community Risk Reduction

By: Chris Orman
East Valley Fire Department
Yakima County, Washington

An applied research project submitted to the National Fire Academy as part of the
Executive Fire Officer Program
April 2004

CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed _____

Chris W. Orman

ABSTRACT

The Stop, Drop & Roll program was intended to decrease burn injuries and death by teaching children a survival technique to perform if their clothes should catch fire. The problem was that there was no data available to validate Stop, Drop & Roll as a needed prevention education program of East Valley Fire Department in Yakima County, Washington.

The evaluative research method was used to answer the following questions:

1. What is the history of Stop Drop & Roll as it relates to clothing fires?
2. What percentage of burn injuries involved clothing fires in Washington State?
3. What are the major causes of fires and burn injuries involving children?
4. What data exists pertaining to the effectiveness of Stop Drop & Roll?
5. How important a part does Stop, Drop & Roll play in the fire prevention program now?

Data from fire prevention sources, the Internet, burn centers, national burn statistics and from printed material were gathered and evaluated. Information on clothing fires and the history of Stop, Drop & Roll was sought which led to information on the Fabric Flammability Act and its history.

It was discovered that clothing related burns and burn deaths have decreased in the past 30 years. Moreover, it was discovered that the phrase, “stop, drop and roll” actually could be confusing people as to what to do in a fire.

It was recommended that Stop, Drop & Roll be removed from East Valley Fire Department’s fire prevention program immediately and that more study on fire prevention programs is needed.

TABLE OF CONTENTS

Introduction.....	Page 5
Background and Significance.....	Page 6
Literature Review.....	Page 8
Procedures.....	Page 16
Results.....	Page 18
Discussion.....	Page 21
Recommendations.....	Page 24
References.....	Page 26

INTRODUCTION

In the past four years, the East Valley Fire Department (EVFD) has established a goal of refining and focusing its fire prevention education programs so as to address actual problems revealed by its fire reporting data. For example, EVFD added a Juvenile Fire Setter Intervention Program to address the problem of structure fires that have been caused by children playing with lighters and matches and other fire tools.

The problem is that the Stop, Drop & Roll program, which is intended to decrease burn injuries and death by teaching children a survival technique to perform if their clothes should catch fire, has not been validated by fire report data, and so it cannot be determined if it is really a needed safety program in Yakima's East Valley.

The purpose of this paper is to gather data regarding the Stop, Drop & Roll program so as to validate it as a needed safety program in Yakima's East Valley.

This paper will use the evaluative research method to answer the following questions:

1. What is the history of Stop, Drop and Roll as it relates to clothing fires?
2. What percentage of burn injuries involves clothing fires in Washington State?
3. What are the major causes of fires and burn injuries involving children?
4. What data exists pertaining to the effectiveness of Stop, Drop & Roll?
5. How important a part does Stop, Drop & Roll play in the fire prevention program now?

BACKGROUND AND SIGNIFICANCE

For decades, the East Valley Fire Department (EVFD) has provided a variety of fire prevention programs to school aged children of the East Valley School District. These prevention programs were gleaned from national programs and often brought to the department by the Yakima County Fire Prevention Association. Historically, these programs were presented to the children by volunteer firefighters who may or may not have had any experience or training in fire prevention education or risk mitigation.

Although EVFD did keep some records of fire calls prior to 2000, there was no consistent database from which to identify trends in fire cause or property loss, nor was there any countywide data collection system in place. Because there was no measure of the problems before fire prevention programs were instituted, there was no measure of any effect the programs might be having.

In 2000 EVFD established a goal of reducing the frequency and intensity of fires within their service area. In 2001, a veteran volunteer firefighter was hired full-time by EVFD specifically to be responsible for fire prevention education and at the same time call data was being gathered and analyzed to assess the hazards and risks present in East Valley. Since then, the fire prevention efforts have become more focused and their effect more measured.

EVFD now has substantial data to establish problems, such as juvenile fire setting and residential structure fire deaths as real or potential problems in East Valley. EVFD fire report data show that children are responsible for nineteen percent of all fires in East Valley, and there are many examples of children and adults dying in house fires locally

and throughout the Nation. Thus, Exit Drills in the Home, and more recently Juvenile Fire-Setter Intervention have become a major parts of the fire prevention program.

But there has never been a documented incident of a child's clothes catching fire in East Valley and no one can remember such a case in Yakima County. Therefore the validity of the Stop, Drop & Roll message must come into question so as to be in line with the Department's prevention program policies.

Besides just achieving a Department goal, in the past four years there have been increasing pressures on the schools to ensure that the children are capable of passing standardized knowledge tests. Teachers are being held accountable for the success or failure of their students and have become more protective of their classroom time with the children. Many other programs, such as the police D.A.R.E. program compete for classroom time with fire prevention.

The number of different programs and messages has increased but the amount of time with the students has not. The fire and injury prevention messages must be imparted quickly and efficiently. Lives can be saved if the children learn the fire prevention lessons. Messages that are not addressing current or potential problems must be re-examined.

If Stop, Drop & Roll is to continue as a fire prevention program, then it must be validated to establish the problem as a real or potential threat to the children in East Valley. Otherwise, the pressures to provide an efficient and clear fire prevention message may cause it to be put aside.

Since East Valley and Yakima County together are too small to gather sufficient statistics regarding the issue, then a larger population must be examined. In this case the

whole State of Washington and the rest of the nation, if necessary, will be examined to establish clothing fires and burns as a substantial problem worth the continued efforts of teaching Stop, Drop & Roll.

The topic of this paper relates to the operational objectives of United States Fire Administration to reduce loss of life from fire in the age group 14 years old and below. The topic directly relates the class work of “Leading Community Risk Reduction” in that it evaluates a fire and injury prevention subject.

LITERATURE REVIEW

The 2003 annual report for East Valley Fire Department stated that fire prevention efforts are Exit Drills in the Home (E.D.I.T.H), Juvenile Fire Setter Intervention (J.F.S), Tools vs. Toys, and Stop, Drop & Roll. There is also a contest for elementary school students in grades two through five to create the best escape plan drawing.

Keith Schrank, EVFD’S fire prevention officer as well as chair of the Yakima County Fire Prevention Association states that Risk Watch program has been offered to the schools, but teachers are reluctant to implement it because of time constraints. However, EVFD does use Risk Watch Fire & Burn Prevention material as part of its fire prevention education. Tools vs. Toys is a program to teach children not to play with dangerous objects. It was developed from portions of Risk Watch modules. Stop, Drop & Roll is also included in the Risk Watch literature. (Shrank, personal communication, March 14, 2004)

Schrank stated further that the following materials are used in delivery of the fire prevention education:

“Risk Watch Safety Program, Grades 3 and 4, Fire & Burn Prevention Lesson 2”, (Lowe’s Home Safety Council, 1998) provides instruction that tells children if their clothes catch fire they should stop, drop and roll. It tells children they should know how to escape from a fire and provides instruction on making an escape plan.

“All About Risk Watch” (Lowe’s Home Safety Council, 1998) states that the Risk Watch is a sequential, comprehensive program of instruction that builds on prior knowledge about injury prevention. (pg 3) It states that it is school-based injury prevention curriculum for children in preschool through eighth grade. (pg 2)

“Freddie Firefighter and Friends”, (Alert-All Corporation) a coloring book utilized by EVFD instructs children in the principles of EDITH. It provides written and visual instruction regarding home escape planning (pp 2 – 4) and provides instruction on what to do if clothes catch fire. (pg 11) It also tells children to “give matches to Mom or Dad” (pg 10)

“Sparky’s fire safety checklist”, a brochure from the National Fire Protection Association (NFPA) asks the reader to “help Sparky hunt for fire hazards”. It asks for yes and no answers to such questions as, “Are matches and lighters locked up high, away from children and does your household have an escape plan?” (NFPA, 2002)

Stop, Drop & Roll is a program that teaches children what to do if their clothes catch on fire. This lesson is also a substantial component of the NFPA Risk Watch program, but its’ origins in East Valley date to earlier programs such as “Learn not to Burn” (NFPA 1981) which was begun by the NFPA in 1973 (O’Dowd, 1995. pg 4).

Fire personnel repeat the Stop, Drop & Roll lesson whenever children visit the fire station, during annual EDITH visits, and at various times throughout the year.

(Schrank, personal communication, March 14, 2004)

Schrank stated that children are instructed that if their clothes catch on fire, they are to cover their face with their hands, drop to their knees, then fall flat on the ground and roll until the flames are out. The children must then demonstrate they can do it. The department's junior firefighter pledge is, "I promise never to play with matches and if my clothes should catch on fire, I will stop, drop and roll." He reiterated that there has never been a documented case of a child's clothes catching fire in East Valley and he is unaware of any such incident in Yakima County. (Schrank, personal communication, March 14, 2004)

O'Dowd (1995, pp 4-5) stated that The NFPA "Learn Not to Burn" program began in 1973 after a national survey was completed to determine the most effective way to deliver fire safety information. The program's approach was to teach the public what it should do, as opposed to what not to do in the event of fire. In addition to other fire safety messages, it included actor/comedian Dick Van Dyke delivering the public service announcement, "Stop, drop and roll, if your clothes catch fire".

Tovey and Vickers (n.d. pp 1-3) stated that the Flammable Fabrics Act was enacted in 1953, "to prohibit the introduction or movement in interstate commerce of articles of wearing apparel and fabrics which are so highly flammable as to be dangerous..." It was updated in 1973 because it was determined that based on the analysis of 580 cases of deaths and injuries due to wearing apparel fires that there was a need for improved flammability standards in children's sleepwear.

Cusick, Grant, and Kucan (1997, pg 473) provided a history of Flammable Fabrics Act, which was first passed in 1953 after a number of serious fire accidents involving rayon fabrics. The act was updated in 1967 to prohibit the sale of all wearing apparel and fabrics classified as highly flammable. Children's sleepwear was included in 1972, however those standards were lowered in 1997 to allow flammable sleepwear for infants nine months and younger.

Downs and Sweet (2003, pg 1) stated that the Consumer Product Safety Commission (CSPC) reviewed National Center for Health Statistics data for 1970 through 1999 and found that thermal burn fatalities in the U.S. from all types of clothing declined sharply during the 1970s. "For children under age 15 there were sixty deaths in 1970, fifteen in 1975, seven in 1980, and six or fewer each year from 1981 to 1999. For children younger than five, deaths decreased from twenty-seven in 1970 to no more than three annually in recent years".

The CSPC also conducted an eight-year study from 1993 to 2001 that showed approximately 1,264 children are treated in emergency rooms each year for clothing-related burn injuries. The average victim's age was seven and males accounted for 74% of clothing-related burn victims. However ages three through five were the most frequent victims. Downs and Sweet said the most common sources of ignition (48%) were lighters and matches and candles (2003, pg 2).

Shari Honari, burn research supervisor at Seattle's, Harborview Medical Center, stated that from January 1999 through December 2003 they had exactly 600 burn patients from age one day to eleven years old, which is an average of 150 per year. The youngest patient was one day old. The burns ranged in severity from .25% to 80%. Of these 600

patients 321 (53%) were burned from hot liquid scalds, and 20 (3.3%) were from hot grease. Chemical, electrical, frostbite, abrasion, flash, and direct contact with hot objects accounted 161 (27%) of the patients. Injuries from flames accounted for 98 (16%) of the patients. Flame burns occurred most often from house fires, outdoor burns, and flammable liquids. (S. Honari, personal communication, March 8, 2004)

Kristen Balding, of the Oregon Burn Center, provided patient data for the years of 1999, 2000, and 2001. During that period, for the pediatric age group of younger than 15 years, the Burn Center has averaged 25 patients per year with scald injuries and 14 per year from flame injuries. Flame injuries are typically from flammable liquids fires, house fires, barbecues, etc. Balding also stated that the appropriate first aid for scalds is to “remove the wet hot clothing” as soon as possible, but that “some children will stop, drop & roll out of confusion”. In 1999 there were only two patients with contact burns, but the average is between ages four and seven since then. One or two injuries requiring treatment are from fireworks injuries each year (K.Balding, personal communication, March 29, 2004).

Pichoff, Schydlower, and Stephenson, (1994, pg 54) stated that small children and infants are at greater risk of serious burns because their skin is less resistant to heat changes thus a full-thickness skin burn will occur in considerably shorter exposure times than adults.

The Burn Survivor Resource Center web-site stated that burn accident statistics show at least 50% of all burn accidents can be prevented. For example, one out of every thirteen structure fire deaths in the United States was caused by a child setting a fire. Children playing with fire cause more than one-third of preschool child deaths by fire.

Burn injuries are second only to motor vehicle accidents as the leading cause of accidental death in the United States.” The kitchen and the bathroom are two most likely places a child age four or younger will be burned. Scalds account for 40 percent of the burn injuries up to age fourteen (http://www.burnsurvivor.com/burn_statistics.html).

The Oregon Health Sciences University, Doernbecher, Safety & Injury Prevention web-site quotes the National Safe Kids Campaign and the U.S. Fire Administration. It states that fires kill almost 600 children each year. Approximately 99,500 children under the age of 14 are treated for burn injuries. 62,580 were thermal burns, 23,620 were scald burns 9400 were chemical burns and 2,250 were electrical burns. Their web-site states, “the majority of fires that kill or injure children are residential fires which are most likely to start in a living or sleeping area. Most fires that start from children playing with fire occur in living and sleeping areas. Over half of the children five years old or younger who die in residential fires are asleep at the time of the fire. 33% are too young to react properly. 40% of the fire deaths of children age nine and younger occur when the child is attempting to escape, is unable to react, or is acting irrationally. Scalds (65%) and contact burns (20%) account for the majority of burn injuries in children four years old or younger“ (http://www.ohsuhealth.com/dch/health/safety/fire_stats.asp).

“Fire In Washington – 2002” reports the top five leading heat sources for fatal fires in 2002 were careless smoking (25%), children with access to an ignition source (10%), electrical equipment (10%), vehicles (8%) and arson (7%) (Washington State Fire Marshal, 2002). The Fire Marshal’s report also stated that there were 931 and 932 intentionally set fires in Washington schools in 2001 and 2002, respectively. These fires

resulted in \$3,698,993 dollars damage in 2001 and \$19,690,891 dollars in damage in 2002.

The Northwest Burn Foundation web-site, February 2004 states that scalds account for 75% of all burns to young children. (<http://www.nwburn.org/newsletter.htm>)

Cusick, Grant, and Kucan (1997) stated that children playing with matches or lighters continue to be the largest single cause of fatal fires in the United States.

Schrank stated that children playing with fire was on the increase in Yakima County and a Juvenile Fire-setter Intervention coalition had been formed to deal with this increasing problem. (Schrank, personal communication, March 14, 2004)

A search for published literature and statistical data on the effectiveness of “Stop, Drop, and Roll” was conducted without results. Searches for published literature or statistics regarding the effectiveness of “Risk Watch”, “Stop, Drop and Roll”, “Learn not to Burn” or other fire prevention program topics yielded few results. Guyton (1995) experienced the same lack of information in 1995 in seeking data regarding the effectiveness of the “Learn Not to Burn” curriculum.

Mike Weller, of the Hagerstown Fire Department in Maryland stated that children who visit their fire prevention program in third grade are asked what they should do if their house is on fire? Many of them respond incorrectly that they would stop, drop and roll. Weller does not keep running statistics regarding this issue. (Weller, personal communication, December 23, 2003)

Schrank reported that out of 40 children in grades from kindergarten to sixth grade, nine (23%) responded, “stop, drop and roll” when asked what they should do if their home was on fire. (Schrank, personal communication, March 14, 2004)

A search of the phrase, “stop, drop and roll” using the search engine, “Google” resulted in several news group conversations that included the phrase, “stop, drop and roll” being used or defined incorrectly and being used in new and different context. The search produced the text of discussions that have taken place in various news groups and chat-rooms.

The term “flaming” is defined on the Internet as the “practice of posting messages that are deliberately hostile and insulting to a discussion board, usually on the Internet. Such messages are called ‘flames’, and are often posted in response to ‘flame bait’”. (<http://en.wikipedia.org/wiki/Flaming>) The term “Stop, Drop and Roll” shows up in internet discussion sites as advice for recovering from such “flaming”. In one such Internet discussion Burrell, M. (1999) wrote, “Remember, in an emergency, stop, drop and roll. It can save your life.”

In a similar Internet discussion forum, [Fulcircle7](#) (2001), wrote, “...in the event of a fire, if initially you cannot exit the building, you drop to the floor and roll, smoke intake will be minimized.”

In summary, Stop, Drop & Roll is a large and important part of the fire prevention program of the East Valley Fire Department. It is s intended to reduce injuries to children if their clothes catch fire.

Nearly 100,000 children are treated for burn injuries each year and an average of 175 children per year are treated in the burn centers serving Washington State. However, burn injuries from clothing fires have decreased dramatically since 1971 and there are six or fewer deaths from clothing related burns on average across the U.S.

Children who play with fire are a leading cause of fires and burns. They are a leading cause of fire in Washington State and in East Valley.

The phrase “stop, drop and roll” may actually be confusing children and adults as to the proper action to take in emergencies. The term has taken on new connotations that are misleading and inaccurate, and may lead to increased confusion in emergencies.

PROCEDURES

An inventory of the all fire prevention programs, brochures, literature, videos and other teaching media offered by East Valley Fire Department was done and they were then evaluated to determine what part “Stop, Drop, & Roll” played in the overall fire prevention program.

Keith Schrank, EVFD’S public education and fire prevention officer and chair of the Yakima County Fire Prevention Association was interviewed on March 14, 2004 at East Valley’s main fire station to provide insights into actual public education programs in EVFD and Yakima County.

A search for pertinent literature, statistical data, and information available at the National Fire Academy’s Learning Resource Center was done for the topics of burns, children, children’s sleepwear, clothing, fire safety, “Stop, Drop and Roll”, Risk Watch, Learn Not to Burn, flammability standards, flammable fabrics act, public education, child safety, fire prevention, clothing, and clothing fires.

The Washington State Fire Marshal’s Office was contacted via e-mail to request fire and burn data. They replied with directions to their Internet web-site, which was accessed and reports for 2001 and 2002 were downloaded and printed.

Mike Weller, of the Hagerstown Fire Department in Maryland was contacted via e-mail to follow up on comments he made at the National Fire Academy's "Leading Community Risk Reduction" class field trip in November of 2003 regarding children who answered, "Stop, drop and roll" in response to the question of "What do you do when your house is on fire"?

Contact was made by phone with Harborview Medical Center, Washington's primary burn center, as well as the Oregon Burn Center to gather statistics on the causes of burn injuries in Washington State. The Oregon Burn Center was included because a large area of southwest Washington uses it as their primary burn center.

All emergency incident statistics for EVFD from 2001 to 2003 were reviewed to establish fire cause trends.

A search of internet sites was done using Microsoft Network (MSN) and Google search engines for the topics, burn injuries, burn injury statistics, burn centers, "Stop, Drop and Roll", burns, children, children's sleepwear, clothing, fire safety, "Learn Not to Burn", flammability standards, flammable fabrics act, public education, child safety, fire prevention, clothing, and clothing fires. The Google search engine was accessed via <http://groups.google.com>.

Limitations

National Fire Incident Reporting System (NFIRS) does not compile statistics regarding the cause of burns.

Washington State NFIRS data was available only for the years 2001 and 2002. Not all fire agencies report NFIRS data to the State. It was decided only to use the 2002 report.

The literature search was initially limited to the past five years, then extended to the past ten years. No literature regarding the effectiveness of Stop, Drop & Roll was located in the LRC database searching for the topics of children, clothes, clothing, burns, fire prevention, public education, fabric fires, safety, or “Stop, Drop and Roll”.

The paper, “Evaluating the Effectiveness of a Risk Watch Pilot Program in Four Jefferson County, Alabama Elementary Schools.” was requested but could not be obtained. It was determined to have been ‘lost’ according to a document received by the Yakima Regional Library.

An article titled, “Beyond Stop, Drop and Roll” printed in Fire Chief magazine in September 2003 was about SafeKids coalitions and had nothing to do with Stop, Drop & Roll.

Data to determine if Stop, Drop & Roll works when used was not located. It was decided not to create a method of experimentation to determine if Stop, Drop & Roll will actually extinguish clothing fires.

Both the Harborview Medical Center and the Oregon Burn Center do not keep statistics regarding the cause of fires that cause burns. The causes of flame related burns that are included are from the respondent’s memory and are not statistically accurate.

RESULTS

1. What is the history of Stop, Drop & Roll as it relates to clothing fires?

The Flammable Fabrics Act was created in response to serious fire accidents involving rayon fabrics in the 1950s. It evolved over the next 20 years to address children’s sleepwear fires. (Cusick, Grant, Kucan, 1997, page 473)

Burn deaths from clothing fires decreased sharply in the 1970s and have continued to decrease since (Downs and Sweet, 2003).

Stop, Drop & Roll is documented as having been a part of the NFPA'S Learn Not to Burn program that began in 1973. In addition to other fire safety messages, it included actor/comedian Dick Van Dyke delivering the public service announcement, "stop, drop and roll, if your clothes catch fire" (O'Dowd, 1995).

Documented evidence regarding whether or not Stop, Drop and Roll is effective in extinguishing clothing fires could not be located.

2. What percentage of burn injuries involves clothing fires in Washington State?

Honari reported that most burns (58%) in children seen at Seattle's Harborview Medical Center from 1999 to 2003 were from scalds and grease burns. 16% were from direct flame contact from sources such as house fires, flammable liquid fires and fireworks (S. Honari, personal communication, March 8, 2004).

Balding reported that the Oregon Burn Center averages 25 patients per year with scald injuries and 17 per year from direct flame contact. She mentioned that sometimes children become confused when scalded and will do the Stop, Drop & Roll maneuver instead of removing or cooling the scalding material. Children with direct flame burns were primarily from house fires, outdoor burning, or they were playing with fire (K. Balding, personal communication, March 29, 2004).

The CSPC study from 1993 to 2001 showed approximately 1,264 children are treated in emergency rooms in the U.S. each year for clothing-related burn injuries. Of these, six per year result in fatalities and of these deaths. Children ages 3 through 5 were

the most likely victims and the most common sources of ignition (48%) were lighters, matches and candles (Downs and Sweet, 2003).

No children have been injured or killed in the past five years due to clothing fires in Yakima County (Schrank, personal communication, March 14, 2004).

3. What are the major causes of fires and burn injuries involving children?

“Fire In Washington – 2002” does not contain statistics for clothing fires. However it does show that most fatal fires occur in the home (page 20) with the kitchen being the most likely place a fire will start, but bedrooms and living areas were the second and third most likely places, respectively (page 14). Children playing with fire are tied as the second leading cause of fatal fires in Washington. Children with matches and lighters were blamed for 1,863 school fires resulting in more than \$22,000,000 dollars in property loss in just two years.

Children playing with fire are responsible for 19% of the working fires in East Valley (EVFD Annual Report, 2003).

The Risk Watch Fire and Burn Prevention module (Lowe's Home Safety Council, 1998, pg 18) states that young children are especially susceptible to scalds.

Pichoff, Schydlower, and Stephenson, (1994, pg 54) stated that small children and infants are at greater risk of serious burns because their skin is less resistant to heat changes thus a full-thickness skin burn will occur in considerably shorter exposure times than adults.

4. What data exists pertaining to the effectiveness of Stop, Drop & Roll?

There is no published data that could be found on the effectiveness of the program or the actual act itself.

Weller reported that 20% of children in his fire safety classes mistakenly respond to the question of what to do when their house is on fire by stating, “stop, drop and roll”.

(Weller, personal communication, December 23, 2003)

Schrank also reported that 9 children out of 40 (23%) responded incorrectly with “stop, drop and roll” when he asked them what they would do if their house were on fire.

(Schrank, personal communication, March 14, 2004)

There is evidence that the term “stop, drop and roll” is taking on a different and inaccurate connotation in Internet chat rooms. Its use is in response to “flaming” which is defined as insulting and hostile messages. It has been cited as an action to take when a room is full of smoke.

5. How important a part does Stop, Drop & Roll play in the fire prevention program now?

Schrank stated that Stop, Drop & Roll was in almost every part of the fire prevention media used by EVFD. It is an integral part of every fire prevention lesson.

(Schrank, personal communication, March 14, 2004)

DISCUSSION

This research yielded surprising results. There is little if any published literature or data pertaining to the effectiveness of fire prevention methods and programs. Scalding burns are far more prevalent than clothing fire burns in children. Very young children’s skin is more susceptible to burn injuries than the skin of older children and adults. Most surprising though was that clothing fires and deaths have decreased so dramatically in the

last 30 years. The most likely victims of burns are younger than EVFD'S current programs are aimed at.

Some findings were not surprising. Children who play with fire are dangerous to others and themselves. Children are at the highest risk of injury and death from fire.

Stop, Drop & Roll is a significant part the fire prevention program of East Valley Fire Department (Schrank, personal communication, March 14,2004; EVFD Annual Report, 2003). However, the information suggests that there is no longer a substantial need for this message to be continued. More importantly, the lesson may actually be counterproductive and potentially harmful.

To illustrate the lack of need one need only look at the CPSC report that 1,264 children are treated in emergency rooms each year for clothing-related burn injuries. There would be an average 3.5 patients per day across the entire nation. Of those fewer than six per year result in fatalities. (Downs and Sweet, 2003). That would mean that Washington State could expect an average of only 25.28 burn incidents per year with a fatality rate average of .04 per year. Therefore, the likelihood of a child suffering a clothing related burn in East Valley is minimal and far below the proportion of emphasis that Stop, Drop & Roll has gotten in the past.

It is clear that burn deaths from clothing fires decreased dramatically since the 1970s (Downs and Sweet, 2003). However, it seems likely that the decrease might have been the result of improved flammability standards and other prevention efforts, such as teaching them not to play with fire, and not because children were armed with a clothing fire survival skill. Since many deadly fires are started by children who play with matches or lighters (Downs and Sweet, 2003; OHSU, 2004; Burn Survivor Resource Center) one

might expect that children's deaths from clothing fires would not be decreasing. But in fact, if child fire play is increasing (Shrank, personal communication, March 14, 2003) one would expect to see an increase in clothing related burns and fatalities, which is not the case.

Children who play with fire cause a tremendous amount of damage and injury and that appears to be the major problem to be dealt with. Children who play with fire are tied, along with electrical equipment, as the second leading cause of fatal fires in Washington. Children with matches and lighters were blamed for 1,863 school fires in 2001 and 2002 resulting in more than \$22,000,000 dollars in property loss. (Washington State Fire Marshal, 2002, pg 11) One of every thirteen structure fire deaths in the United States was caused by a child setting a fire and children playing with fire cause more than one-third of preschool child deaths by fire (Burnsurvivor.com). Nationally, children playing with matches or lighters continue to be the largest single cause of fatal fires in the United States (Cusick, Grant, and Kucan, 1997). Children playing with fire are responsible for 19% of the working fires in East Valley (EVFD Annual Report, 2003). Children playing with fire are a serious problem and likely the cause of many of the clothing related fires to begin with.

Weller (personal communication, December 15, 2003), Shrank (personal communication, March 4, 2004) and Balding (personal communication, March 29, 2004) all cited that the phrase is confusing children as to what to do in an actual emergency. It continues to confuse adults as evidenced by Internet conversations. In fact, it has taken on a new connotation in the world of cyberspace – a connotation that is inaccurate and possibly dangerous in the sense of fire prevention. This seems to be an ominous

indication that what we are teaching may actually have a detrimental affect in some instances

The Oregon Health Sciences University web-site states that nearly 100,000 children are treated for burn injuries each year. The Burn Survivor Resource Center web site states that burn accident statistics show that at least 50% of all burn accidents can be prevented. Stop, Drop & Roll, however, is not a prevention method, but a survival technique to use after the terrible problem has started. Burn injuries and fire deaths are often a result of children playing with fire and therefore prevention efforts should be focused on this fire playing behavior. Moreover, Stop, Drop & Roll may be confusing some children and adults alike when emergencies arise. Increased deaths and injuries may result from people taking the wrong action in the event of a fire.

RECOMMENDATIONS

1. EVFD should continue to strive to match its' fire prevention programs to known fire problems. The Department should continue to gather fire report data to determine the effect that fire prevention programs are having on the fire problems.
2. The number of burn injuries and deaths from clothing related fires is minimal. Burn injuries and deaths probably have decreased over the past three decades due to vigilant enforcement of flammable fabric laws, and teaching children not to play with fire, not from teaching Stop, Drop & Roll. There is likelihood that Stop, Drop & Roll causes confusion in other fire and burn situations. It has taken on new and different connotations as a phrase on the Internet, adding to the potential for confusion. Fire prevention messages should be clear and concise so as to be

- drawn upon by children when they are needed and confusing messages should be eliminated. For these reasons, the East Valley Fire Department should immediately curtail the Stop, Drop & Roll” message and eliminate it from all media and programs.
3. EVFD should continue to quiz children on the question of what to do if their house is on fire to gather hard data and to ensure that children can state the correct answer.
 4. Decreasing fire play among children will have the effect of decreasing fires and decreasing the resulting burns and deaths. Therefore EVFD should focus fire prevention efforts on decreasing Juvenile Fire Setting behavior.
 5. Study should take place to determine if Stop, Drop & Roll techniques are effective at extinguishing flames of clothing fires.
 6. Data should be collected in NFIRS to determine what percentage of burned children start the fire that burns them.
 7. Data should be collected in NFIRS to determine what actions any person takes when they are on fire to see if they indeed use Stop, Drop a& Roll and if so, is it effective?
 8. The National Fire Academy should strongly encourage Executive Fire Officer Program students to study fire prevention programs, methods and techniques and their effectiveness so as to increase the bank of data on this subject.

References

- Alert-All Corporation. (n.d.) Freddie firefighter and friends coloring book. (Available from www.alertall.com)
- Burn Survivor Resource Center. Burn statistics. (n.d.). Retrieved March, 8, 2004, from http://www.ohsuhealth.com/dch/health/safety/fire_statistics.html
- Burrell, M. (September 9, 2001) Re: Something to consider [msg 18]
 Message posted to <http://groups.google.com/groups?hl=en&lr=&ie=UTF-8&q=mike+burrell+re:something+to+consider>
- Cusick, J.M., Grant, E.J., Kucan, J.O. (1997). Children's sleepwear: relaxation of the Consumer Products Safety Commission's flammability standards. *Journal of Burn Care and Rehabilitation*, 18(5), 469-476
- Downs, C.E. and Sweet, D. (2003). Burn center reporting system. *Consumer Product Safety Review*, 8(2) 1-2
- East Valley Fire Department Annual Report 2003. (Available from East Valley Fire Department, 2003 Beaudry Road, Yakima, Washington, 98901.
- Fullcircle7 (October 12, 1999) Stop, Drop and Roll vs Smoking [msg 1]
 Message posted to <http://groups.google.com/groups?hl=en&lr=&ie=UTF-8&q=fulcircle7+Stop+drop+and+roll>
- Guyton. F.S. (1995) *A study of the effectiveness of the City of Porterville Fire Department's Learn Not To Burn program*. Fire Officer Program research paper. National Fire Academy, Emmitsburg, MD.

- Lowe's Home Safety Council. (1998). *Risk Watch*. Quincy, MA: National Fire Protection Association.
- National Fire Protection Association. (1991). *Learn not to burn*. Quincy, MA: Author.
- National Fire Protection Association. (1991). *Sparky's Fire Safety Checklist* [Brochure]. Quincy, MA: Author.
- O'Dowd, M.J. (1995) *The Importance of implementing the N.F.P.A.'S learn not to burn program*. Fire Officer Program research paper. National Fire Academy, Emmitsburg, MD.
- Oregon Health Sciences University Health. Safety and injury prevention. (n.d.). Retrieved March, 8, 2004 from http://www.ohsuhealth.com/dch/health/safety/fire_stats.asp
- Pichoff, B.E., Schydlower, M., Stephenson, S.R. (1994). Children at risk for accidental burns from hot tap water. *Texas Medicine*. 90 (11), 54-58.
- Poblete, L., Beyond Stop, Drop and Roll, *Fire Chief*, 47 (9), 66-68
- Tovey, H. and Vickers, A., (n.d.) Fire Accidents involving children's sleepwear statistics and characteristics. (Available from U.S. Department of Commerce, Washington D.C.)
- Washington State Fire Marshal (2002). Fire in Washington. (Available from Washington State Patrol, General Administration Building, P.O. Box 42600, Olympia, Washington, 98504-2600).
- Wikipedia. Flaming. (n.d.). Retrieved April, 13, 2004 from <http://en.wikipedia.org/wiki/Flaming>