

University of Pennsylvania Health System

FAX COVER SHEET

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University of Pennsylvania Health System



Brandywine Health System



Date: 3/14/01

Number of pages including cover sheet: 2

TO: Sadge E. Dunn, Secretary
Consumer Product Safety Commission

FROM: Michael B. Shapiro, MD.

FAX #: 301 504-0127

FAX #: (610) 383-8352

COMMENTS:

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Dunn, Sadye E.

From: Shapiro, Michael - Trauma [ShapiroM@uphs.upenn.edu]
Sent: Wednesday, March 14, 2001 10:02 AM
To: 'cpscc-os@cpsc.gov'
Subject: petition HP01-1

Sadye E. Dunn, Secretary
Consumer Products Safety Commission
Washington, DC 20207

RE: Petition HP01-1, petition for bicycle handlebar performance standard

Dear Secretary Dunn:

This letter supports the petition for performance standards for bicycle handlebars. I am a practicing trauma surgeon at the Hospital of the University of Pennsylvania and have been able to witness first hand the injuries obtained from striking bicycle handlebars. Many children are hospitalized at our institution and our affiliated Trauma centers in the Philadelphia area due to injuries sustained after impacting a handlebar, and these represent a high percentage of children hospitalized for bicycle-related injuries.

Several of these injuries have been rather severe, the result of a relatively small object, that is the end of the handlebar, striking the abdomen, during a minor accident. This focuses a great degree of energy on the abdomen, i.e., the point of impact. My concern arises not just from my professional experience; I have three small children of my own, just reaching bicycling age, and my interests include making this exercise potentially safer for them.

I wholeheartedly support any efforts to minimize the risk of injury related to bicycle handlebars and think that regulating the performance of handlebars would be a significant advance. If I can provide any further information, please do not hesitate to contact me.

Sincerely,

Michael B. Shapiro, M.D., FACS
Asst. Professor, Dept. of Surgery,
University of Pennsylvania Medical School
Medical Director, Surgical Intensive Care Unit,
Hospital of the University of Pennsylvania



Regional Trauma Center

March 16, 2001

Sadye E. Dunn, Secretary
Consumer Products Safety Commission
Washington, DC 20207

RE: Petition HP01-1, petition for bicycle handlebar performance standard

Dear Secretary Dunn:

This letter supports the petition for performance standards for bicycle handlebars. I am the trauma program coordinator at St. Luke's Hospital and have been able to witness first hand the injuries obtained from striking bicycle handlebars. In the past year, we have treated several children who were injured as a result of handlebars.

Several of these injuries have been rather severe, the result of a relatively small object, that is the end of the handlebar, striking the abdomen, during a minor accident - like a fall. This focuses a great degree of energy on the abdomen of children. Often these children require surgery, as well as a prolonged hospitalization from these injuries.

I wholeheartedly support any efforts to minimize the risk of injury related to bicycle handlebars and think that regulating the performance of handlebars would be a great advance. If I can provide any further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Kay Marsteller". The signature is fluid and cursive, with a long horizontal line extending to the right.

Kay Marsteller, RN, BSN
Trauma Program Coordinator

KEM/hjw



*Luigi
Lundin* 18

March 16, 2001

Sadye E. Dunn, Secretary
Consumer Products Safety Commission
Washington, DC 20207

RE: Petition HP01-1, petition for bicycle handlebar performance standard

Dear Secretary Dunn:

This letter supports the petition for performance standards for bicycle handlebars. I am a practicing trauma surgeon at St. Luke's Hospital and have been able to witness first hand the injuries obtained from striking bicycle handlebars. In the past year, we have treated several children who were injured as a result of handlebars.

Several of these injuries have been rather severe, the result of a relatively small object, that is the end of the handlebar, striking the abdomen, during a minor accident - like a fall. This focuses a great degree of energy on the abdomen of children. Often these children require surgery, as well as a prolonged hospitalization from these injuries.

I wholeheartedly support any efforts to minimize the risk of injury related to bicycle handlebars and think that regulating the performance of handlebars would be a great advance. If I can provide any further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Reilly".

James F. Reilly, M.D., FACS
Associate Trauma Program Medical Director

JFR/hjw

Stevenson, Todd A.

*19 bicycl
handlebar
standard*

From: Haskell, Robin M. [RMHaskel@LHA.org]
Sent: Monday, March 19, 2001 9:28 PM
To: 'cpsc-os@cpsc.gov'
Cc: 'nance@email.chop.edu'; 'schwabc@uphs.upenn.edu'
Subject: Petition HP 01-1, Petition for Bicycle Handlebar Performance Standard

Attention: Sadye Dunn

Dear Ms. Dunn,

I am writing in support of Petition HP 01-1, Petition for Bicycle Handlebar Performance Standard. According to the petitioner, Dr. Flaura Koplin Winston, bicycle handlebars pose a serious risk of splenic, intestinal, liver, pancreatic, and renal injuries, particularly to young children. She maintains that bicycle handlebars act as "blunt spears", causing a focal point of energy transfer to internal abdominal organs.

Anecdotally, I have witnessed the impact of such abdominal injuries on children and their families. These injuries can cause numerous grave complications, such as hemorrhage, infection, and death. In addition to these physiologic concerns, there is often long term disruption in everyday family life, including school absenteeism, parent absenteeism from work, and the difficult responsibility of taking care of siblings while the injured child is acutely ill and convalescing. Moreover, the financial burden of serious injury to affected families and to society at large must not be overlooked.

Because such serious injuries can occur even in the setting of minor accidents, it is imperative that the Consumer Product Safety Commission develops a performance standard for bicycle handlebars regarding energy dissipation and distribution during impact. Dissipation of energy over a larger abdominal surface area would certainly result in fewer critical injuries to underlying organs.

I appreciate the opportunity to support this petition, and I thank you for your attention. Please do not hesitate to contact me if I can be of further assistance.

Sincerely,

Robin Haskell, CRNP
Parent and Trauma Nurse Practitioner
Brandywine Hospital and Trauma Center
201 Reeceville Road
Coatesville, PA 19320
610.383.8399 office
610.383.8352 fax

*Joseph
Kardelak 20*

140 Springhouse Lane
Pittsburgh, PA 15238
March 21, 2001

VIA FACSIMILE

Ms. Rockelle Hammond
Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207

**SUBJECT: PETITION HP 01-1, PETITION FOR BICYCLE HANDLEBAR
PERFORMANCE STANDARD**

Dear Ms. Hammond:

The following story that appears on the Children's Hospital of Pittsburgh's web-site, outlines the results of a terrible accident my son suffered in September of 1999. He was traveling at a low rate of speed and when he lost control of the bike, he fell onto the blunt end of the handlebar and was impaled. There are several fixes that manufactures could employ such as collapsible handlebars or rounded and bigger handlebar ends.

Please read Harrison's story and act upon the petition. Thank you.

Sincerely,



Richard J. Goldberg

RJG/jv
Attachment



for health care professionals



click here for safety tips

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- Street & Off-road
- Home & Yard
- Holiday & Winter

Good As New



Kids and bikes go together like peanut butter and jelly. It's a natural combination. There they go—racing in the fresh air, laughing and burning off excess energy. But even with helmets and adult supervision, accidents can happen. And even the simple accidents can become dangerously serious. Just ask Harrison Goldberg and his family.

Harrison took a tumble off his bike in late September 1999. He and his nine-year-old identical twin brother, Reid, and some friends were having fun on their bikes when Harrison "hit a bump weird and landed on the handle bars."

The seriousness of Harrison's injury did not become apparent until a short time later when he was examined in the emergency room at Children's Hospital.

Rich Goldberg, his dad, was there. "I went over to him," says Rich, "and he was curled up, complaining that he couldn't breathe. He said he had a pain in his stomach, so, I lifted up his shirt expecting to see a bruise or some bleeding. But, there weren't any marks at all. I assumed that he just got the wind knocked out of him."

But Harrison's pain worsened, and the Goldbergs called an ambulance. The seriousness of Harrison's injury did not become apparent until a short time later when he was examined in the emergency room at Children's Hospital.

Harrison's mother,
Emily Goldberg,

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Printer-Friendly Tip Sheets

minutes of being in the emergency room. Dr. [Henri] Ford (the director of the Benedum Pediatric Trauma Program at Children's) told us that Harrison needed emergency surgery. His abdomen was filling up with blood and something needed to be done immediately. During surgery they found a severe liver laceration. It had been punctured internally."



Harrison was in a life-threatening situation. The surgical team needed to stop the bleeding, so they packed his abdomen and then medically induced a coma for 48 hours to keep him motionless. Harrison's condition had to stabilize so doctors could perform a second operation to repair his damaged liver.

"If they could stop the bleeding within 48 hours, they expected Harrison to have a full recovery. Those were two long days," Rich explains. When surgeons went back in, they were able to make the needed repairs and found no damage to any of Harrison's other organs.

Many Pittsburghers tend to take places like Children's Hospital for granted, observes Rich. "If we lived somewhere else, I wonder what might have happened. There's really no question that with the severity of Harrison's injury, the outcome could have been very different. I firmly believe that having pediatric trauma surgeons, pediatric anesthesiologists, pediatric equipment and experienced pediatric nursing care really makes a difference," adds Rich.



Indeed, Harrison did have some heavy hitters pulling for him, including heavy weight pro-wrestler "Goldberg" (no relation). Goldberg learned of the accident and e-mailed and called Harrison to wish him well. "Stay strong, Shorty," he wrote.

Harrison made it, but not without facing additional challenges after coming home. Emily says Harrison

was returned to the hospital several times in the fall because of infections. Then he underwent surgery again at the end of December to correct an intestinal blockage, a condition that developed because of his injury. He came home again on New Year's Eve in time for the dawn of the new millennium.

Though Harrison missed 65 out of 90 days of school, he still managed to achieve straight As. One of his school projects this year was to look ahead to the next millennium – the year 3000. He had to predict what new invention will be in use that doesn't exist today. Harrison says, "I think the invention will be a force field around your organs so they can't be cracked or injured." People will get the force field when they are babies. Who will be the inventors? Dr. Henri Ford and Bill Gates. Harrison replies.

Surprisingly, considering the seriousness of his injury, a mere nine months after the accident, Harrison was deemed "back to normal" and headed off to summer camp. Emily reports, "He's running, jumping and fighting – just like normal." Rich adds, "He got a new bike, and he jumped right on it and rode just like he did (before the accident)."

Actually, side by side, it's hard to tell one twin from the other. It was hard before the accident. It still is. According to Rich, it gives new meaning to the old phrase, "good as new."

Top





*high
handlebar
comment
9/*

Sadye E. Dunn, Secretary
Consumer Products Safety Commission
Washington, D.C. 20207

RE: Petition HP01-1, petition for bicycle handlebar performance standard

Dear Secretary Dunn

This letter supports the above cited petition for performance standards for bicycle handlebars. I am a practicing trauma surgeon at the University of Pennsylvania and have helped to treat patients with severe intra-abdominal injuries resulting from deceleration into handlebars. The Children's Hospital of Philadelphia has admitted several children with injuries from this mechanism.

It is my understanding that design modification in handlebars may diminish the amount and severity of these types of injuries. I hope that the commission will approve the aforementioned petition and amend the current standards under title 15, section 1512.6 of the US code.

Thank you for your time and effort in this matter.

John P. Pryor, MD
Trauma Surgeon





UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM

Bicycle handlebars comment

22

University of Pennsylvania School of Medicine
Hospital of the University of Pennsylvania

Patrick M. Reilly, MD, FACS
Assistant Professor of Surgery

Trauma Program Director
Division of Traumatology & Surgical Critical Care

March 23, 2001

Sadye E. Dunn, Secretary
Consumer Product Safety Commission
Washington, DC 20207

RE: Petition HP01-1, petition for bicycle handlebar performance standard

Dear Secretary Dunn:

This letter supports the petition for performance standards for bicycle handlebars. We are trauma care practitioners in Philadelphia at the Hospital of the University of Pennsylvania, a Pennsylvania Regional Resource Trauma Center. We are well aware of the injuries obtained from striking bicycle handlebars. Our neighboring children's trauma facility, The Children's Hospital of Philadelphia sees a number of these devastating, preventable handlebar injuries each year.

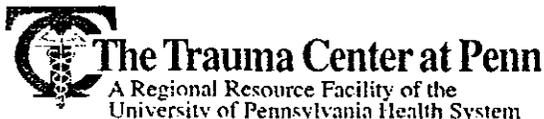
We wholeheartedly support any efforts to minimize the risk of injury related to bicycle handlebars and think that regulating the performance of handlebars would be a great advance. If we can provide any further information, please do not hesitate to contact us.

Sincerely,

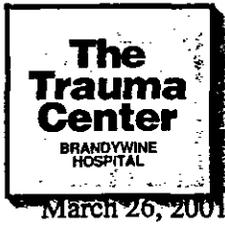
Patrick Reilly, MD FACS
Trauma Program Director
Division of Traumatology & Surgical Critical Care
Care

Kate FitzPatrick, RN MSN
Trauma Program Manager
Division of Traumatology & Surgical Critical
Care

cc: File



*Bicycle handlebar
committee 23*



Sadye E. Dunn
Secretary, Consumer Products Safety Committee
Washington, D.C. 20207

Dear Secretary Dunn:

Re: **Petition HP01-1 (Petition for Bicycle Handlebar Performance Standard)**

The purpose of this letter is to support the petition for performance standards for bicycle handlebars. I am the Director of the Trauma Program at Brandywine Hospital and have witnessed the serious intra-abdominal injuries as a result of children striking bicycle handlebars. Despite the seemingly benign nature of such a mechanism of injury, significant injuries are common to the pancreas, intestines, liver, spleen and kidneys in young children. The major problem is that a large amount of kinetic energy is concentrated over a small area (i.e., the child's abdomen). Not infrequently, these injuries require exploratory surgery and surgical repair of the identified injuries.

I wholeheartedly support any efforts to minimize the risk of injury related to bicycle handlebars through modifications of their design. If I can provide any further information, please do not hesitate to call me.

Sincerely,

William S. Hoff, M.D., F.A.C.S.
Trauma Program Medical Director, Brandywine Hospital
Assistant Professor of Surgery, University of Pennsylvania Medical Center

WSH/pmk

cc: C. William Schwab, M.D.
Michael Nance, M.D.
Legislative Issues File

William S. Hoff, MD, FACS

Chairman
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24 bicycl handlebars

Bartholomew J. Tortella, MTS, MD, MBA, FACS

Hahnemann Trauma Center
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www.mcphu.edu

6 April 2001

Sadye E. Dunn
Secretary
Consumer Products Safety Commission
Washington, DC 20207

RE: Petition HP01 – 1, Petition for Bicycle Handlebar Performance Standard

Dear Secretary Dunn:

This is a letter strongly supports performance standards for bicycle handlebars. As a Trauma Surgeon at the Hahnemann Trauma Center, I have been a personal witness to the devastation caused to children by injuries from bicycle handlebars. Further, as the father of a four year old, I am constant vigilant of his use of the bicycle and have personally padded a portion of the handlebars.

Several of the severe injuries that I have treated have resulted from the end of the handlebar "spearing" the abdomen during a relatively minor accident, like a trip and fall incident. The small end of the handlebar concentrates a tremendous amount of energy in a small area and produces devastating injuries.

I wholeheartedly support and urge the adoption of any efforts to minimize the risk of injury related to bicycle handlebars and think regulating the performance of handlebars would be a great advance. If I can provide any further information, please feel free to contact me.

Yours truly,

Bartholomew J. Tortella, MTS, MD, MBA, FACS
Chief, Trauma & Surgical Critical Care
Hahnemann Trauma Center
Associate Professor of Surgery
MCP Hahnemann University



*Luigi
Hanselmann*

April 11, 2001

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Sadye E. Dunn, Secretary
Consumer Products Safety Commission
Washington, DC 20207

RE: Petition HP01-1, Petition for bicycle handlebar performance standard

Dear Secretary Dunn:

I am writing this letter in support of the petition for performance standards for bicycle handlebars. Children's Hospital of Pittsburgh is a Level I Pediatric Trauma Center accredited by the Pennsylvania Trauma Systems Foundation. We admit approximately 1,200 trauma patients per year in the western portion of Pennsylvania. Most of these injuries could have been prevented. During the past year, the Benedum Pediatric Trauma Program at CHP admitted 164 children with bicycle-related injuries. Thirty percent of these children were hospitalized at our institution as a result of injuries sustained following impact with the handlebar.

Several of these injuries were severe. Anatomically, children are smaller than adults, with less subcutaneous tissue, less muscle mass and a more pliable rib cage which results in less protection for vital organs. Although the end of a handlebar may appear to be a relatively small object, when one considers these anatomical differences, however, the handlebar potentially becomes a small missile. The handlebar concentrates a high degree of energy on the abdomen of a child often resulting in major spleen, liver or pancreatic laceration. Some of these injuries are life threatening. One percent of the children who sustained blunt abdominal injuries related to the handlebars of a bicycle have required operative interventions.

In September of 1999, a 9 year old boy was struck in the abdomen with the handlebar of his bicycle approximately 15 minutes from Children's Hospital of Pittsburgh. His father's initial thought was that "the wind had been knocked out of him." However, it quickly became apparent that he was severely injured when he found him to be pale and diaphoretic. He was rushed to the hospital and emergently taken to the operating room with a Grade V liver laceration. He required two attending surgeons to stabilize the massive amount of bleeding that resulted from the liver injury. He subsequently underwent two additional operations to fully repair the injury, and it took

nearly a year for him to fully recover. This is only one of many incidents that we could share with you. These types of life-threatening incidents mandate better, safer design of bicycle handlebars.

As Director of the Benedum Pediatric Trauma Program, I wholeheartedly support any effort to minimize the risk of injury related to bicycle handlebars and believe that regulating the performance of handlebars would be very advantageous. If I can provide any further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Henri Ford", followed by a horizontal line extending to the right.

Henri R. Ford, MD
Director, Benedum Pediatric Trauma Program
Director, Injury Prevention Program

Raymond Angelo



American Red Cross

Southeastern Pennsylvania Chapter
23rd & Chestnut Streets
Philadelphia, PA 19103
(215) 299-4000 • Fax (215) 299-4089

Raymond Angelo, *Chairman of the Board*
A. Frank Donaghue, *Chief Executive Officer*

April 11, 2001

Sadye E. Dunn, Secretary
Consumer Products Safety Commission
Washington, DC 20207

RE: Petition HPO1-1, petition for bicycle handlebar performance standard

Dear Secretary Dunn:

This letter supports the petition for performance standards for bicycle handlebars. The Southeastern Pennsylvania Chapter of the American Red Cross is proud to be a part of the Injury Free Coalition for Kids of Philadelphia, as we are concerned about issues that threaten the safety and welfare of children.

Since our Chapter's inception in 1917, we have been providing youth services in the Delaware Valley for the purpose of promoting safety and prevention skills to enable children to make healthy decisions. We help children and their families prevent, prepare for and respond to life's emergencies. Prevention of injury is part of our mission.

I wholeheartedly support any efforts to minimize the risk of injury related to bicycle handlebars and think that regulating the performance of handlebars would be a great advance.

Sincerely,

A. Frank Donaghue
Chief Executive Officer

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*David B. Hoyt
Chair, Committee on Trauma
27*

April 12, 2001

Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207

Dear Sir or Madam:

I am writing to express my hope that you will support the petition for initiation of a performance standard for bicycle handlebars in regard to energy dissipation and distribution during impact. Bicycle handlebars pose a threat of serious abdominal injuries on impact to children even in the slightest accident. A performance standard in the manufacture of handlebars would require that they be designed to spread the force over a larger surface area alleviating the chance of severe injury to the internal abdominal organs due to the spear-like design presently in use. I have no question that these safety standards will ultimately reduce serious injury to our children.

I urge you to support this petition to improve bicycle handlebar safety.

Sincerely,

David B. Hoyt, M.D., FACS
Chair, Committee on Trauma

DBH/gct

Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207

4/3/2001
28
Bicycle
Handlebar
Standard

Subject: Petition HP 01-1, Petition for Bicycle
Handlebar Performance Standard

To Whom It May Concern:

My grandson had a disastrous and dreadful accident when he fell of his bicycle and was speared by the straight across handle bars of his bicycle.

This accident occurred in September 1999; my wife and I ran immediately to Pittsburgh's Children's Hospital. We saw him in EMERGENCY just as they were wheeling him out of Xray. He was pale white and fortunately Dr. (Henri) Ford (the director of the Benedum Pediatric Trauma Program at Children's) saw him in the hall and immediately observed that his abdomen was filling up with blood and rushed him into surgery. There was no doubt that Dr. Ford saved his life by taking this action.

Harrison's liver was punctured, or lacerated and was bleeding internally. It took two major operations—one to pack his liver and then 48 hours later—an operation to repair his liver. They kept him in an induced coma during all this time.

Then intensive care for weeks—the wonderful care and kindness and skill that Harrison got thru this period at Children's Hospital was beyond description.

After being home for a short time, they had to open Harrison abdomen up again because of scar tissue and intestinal blockage.

Nine years old and weeks of hospital and months of recovery and family and friends at the hospital around the clock—all this came from simply falling off his bicycle BUT THE STRAIGHT ACROSS HANDLE BARS WITH NO PADDING OR WHATEVER SPEARED HARRISON'S BODY.

Falling off a bicycle is not a rare accident—take the fact that there are laws or parental control that requires use of a helmet because of the possibility of falling off a bicycle. BUT if you are speared by the straight handle bars with built-in hard ends, you can be seriously injured or may die.

As a concerned grandfather (and realizing that his twin brother would be bike riding as well as other children), I took it upon myself to see what do bicycle shops have that would limit or prevent such "spearing".. Not only there were no handlebar handles made to take care of such accidents, but all the shops had replacement handles that were harder on the ends (where one could be speared) because they ware out on the ends. Even suggesting that maybe such soft end replacement might be available—they practically walked away from me. They had me look at the bicycle manufacturer catalogues but there was no consideration of making anything but hardened handles.

In looking at many bicycle, I realized that PRACTICALLY ALL THE CHILDREN BICYCLE HANDLEBARS WERE STRAIGHT ACROSS WITH HARD ENDS .

CAN WE PROTECT OUR CHILDREN?

CAN WE WARN PARENTS AND OTHERS OF THE POSSIBILITY OF DEATH OR A LONG HOSPITAL STAY OF THEIR CHILDREN FALLING OFF THEIR BICYCLES WITH STRAIGHT ACROSS HANDLE BARS WITH NO PROTECTION ON THE ENDS.

Respectfully yours,
Edgar Landerman
Edgar Landerman
552 North Neville St.
Pittsburgh, Pa. 15213

E-Mail: Edgarpgh@AOL.com

2001 MAR 27 11 49 32
MAIL ROOM
U.S. DEPARTMENT OF JUSTICE

The Children's Hospital of Philadelphia

34th Street and
Civic Center Boulevard
Philadelphia, Pa. 19104-4399
215-590-1000

29
with
the
comment

April 16, 2001

Sadye E. Dunn, Secretary
Office of the Secretary
Consumer Product Safety Commission,
Washington, DC
20207

Re: "Petition HP 01-1, Petition for Bicycle Handlebar Performance Standard."

Dear Ms. Dunn:

This letter provides preliminary data regarding national estimates of the incidence and costs associated with serious handlebar-related injuries in children. These data are intended for use in considering regulation of the performance of handlebars regarding their energy dissipation and distribution during impact. 1997 US Census data and two data sources, described below, were utilized for these analyses:

- *19-State Hospital Discharge Data for 1997* (created by Hank Weiss, PhD (An author of this document) with Ted Miller, PhD and Bruce Lawrence PhD of the Pacific Institute for Research and Evaluation),

The 19 states included in this dataset are as follows: AZ, CA, FL, ME, MD, MA, MI, NE, NH, NJ, NY, PA, RI, SC, UT, VT, VA, WA, and WI. These states make up 52% of the population of children under 20 years old in the United States. The dataset is a census of 1997 hospitalizations in the included states and includes data regarding the nature and cause of injury (International Classification of Disease, 9th revision and Clinical Modification - ICD-9CM - and External Cause of Injury Codes - E-codes), associated hospital costs, and patient demographics for the patients. This database was used to determine the national estimate of incidence of abdominal and pelvic organ injury and associated costs for child bicyclists. These data are limited because there is not a specific E-code for handlebar-associated injury. However, estimates of the proportion of hospitalized bicycle-related abdominal and pelvic injuries that are handlebar-associated were made from The Children's Hospital of Philadelphia (CHOP) Trauma Registry.

- *The Children's Hospital of Philadelphia Trauma Registry for 1996 to 2000*
The Children's Hospital of Philadelphia is the Level One Pediatric Trauma Center for Southeastern Pennsylvania and the Delaware Valley (one of two Level One Pediatric Trauma Centers in the state). The trauma registry is a census of trauma admissions to CHOP. Medical records for all children with bicycle-related injuries were reviewed to determine the involvement of handlebars in the injury event.

Case selection and stratification criteria

Subjects were selected based on E-codes that indicated a bicycle-related injury (E81X.6, E821.6) in a child under the age of 20 years. Subjects were then stratified based on any ICD-9 CM which indicated a significant abdominal or pelvic organ injury which would translate to an Abbreviated Injury Scale (AIS – Association for the Advancement of Automotive Medicine scaling system) score of 2 or greater. An AIS 2 or greater injury indicates organ damage.

The same criteria were used for case selection and analysis on the 19-state hospital discharge database and with the CHOP Trauma Registry. The ICD-9CM codes that were included are as follows:

- 863 - Injury to gastrointestinal tract
- 864 - Injury to liver
- 865 - Injury to spleen
- 866 - Injury to kidney
- 867 - Injury to pelvic organs
- 868 - Injury to other intra-abdominal organs
- 902 - Injury to blood vessels of abdomen and pelvis

E-codes were stratified into motor vehicle-related (E81X.6) and non-motor vehicle-related (E821.6) bicycle injuries. Previous literature has suggested, and in-depth investigations conducted at CHOP has corroborated, that handlebar-related injuries occur predominantly with bicycle crashes or bicycle falls not involving motor vehicles. For our estimate of handlebar-related injuries, we only included non-motor vehicle-related bicycle crashes because, in these events, the role of the handlebar in injury causation was more apparent than in motor vehicle-related bicycle crashes. Our estimates of the incidence of handlebar-related injury are, therefore, conservative in that the following were excluded from our analyses:

- abdominal or pelvic injuries occurring in motor vehicle-related bicycle crashes;
- patients, ages 20 years or older;
- minor handlebar-related injuries, including superficial contusions, abrasions, and lacerations; and
- handlebar-related injuries to body regions other than the abdominal or pelvic organs.

Main Outcome Measure(s)

Incidence of injury; total hospital charges; lifetime medical costs; lifetime production loss; and lifetime monetized Quality-Adjusted Life Years (QALY's) (Methodology, as developed by Ted Miller, PhD of the Pacific Institute for Research and Evaluation. For specific methodologies, please contact the authors of this letter.)

Obtaining national estimates of handlebar-related abdominal or pelvic organ injury

Based on 1997 US Census data, the 19 states included in the 19 States Hospital Discharge dataset represent 52% of the nation's children. To obtain the national estimates of child bicyclist abdominal or pelvic organ injury (AIS 2 or greater injuries), data from the 19 States Hospital Discharge Dataset were multiplied by 1.92. Further, estimates of the proportion of these injuries associated with handlebars was derived by multiplying national estimates for non-motor vehicle-related abdominal or pelvic organ injuries by the proportion of these injuries that were associated with handlebars (as determined by medical record review at CHOP).

Results:

Based on the 19-State Hospital Discharge Database:

696 child bicyclists under 20 years of age were hospitalized for abdominal or pelvic organ injury (AIS ≥ 2) in the 19 states in 1997 (See Table 1). 541 (78%) of these children were injured in bicycle crashes not involving motor vehicles. The associated costs of these non-motor vehicle-related abdominal or pelvic organ injuries were as follows:

Total direct hospital costs:	\$6,096,852
Total lifetime medical loss:	\$6,045,600
Total lifetime production loss:	\$6,634,163
Total lifetime monetized QALY's:	\$302,045,404

Table 1: Abdominal or Pelvic Organ (AIS 2 or greater) Injuries to Bicyclists Ages 0-19 (19 States Hospital Discharge Data, 1997)

Age	MV-related n (col. %)	Non-MV-related n (col. %)	Total n (col. %)
Under 5 yrs	4 (2.6%)	11 (2.0%)	15 (2.2%)
5-9 yrs	44 (28.4%)	151 (27.9%)	195 (28.0%)
10-14 yrs	67 (43.2%)	276 (51.0%)	343 (49.3%)
15-19 yrs	40 (25.8%)	103 (19.0%)	143 (20.5%)
TOTAL	155 (100.0%)	541 (100.0%)	696 (100.0%)

Based on the Children's Hospital of Philadelphia Trauma Registry:

56 child bicyclists were admitted to CHOP for treatment of AIS 2 or greater abdominal or pelvic organ injuries between 1996 and 2000. 44 of these children (78.5%) were injured in bicycle crashes not involving motor vehicles. All of the handlebar-related injuries occurred in crashes not involving motor vehicles. Handlebars were involved in 38 of the 44 non-motor vehicle-related crashes (86.4%) which caused abdominal or pelvic organ injuries.

Table 2: Abdominal or Pelvic Organ Injuries (AIS 2 or greater) to Child Bicyclists (CHOP Trauma Registry, 1996-2000)

	MV-related n (%)	Non-MV-related n (%)	Total
Handlebar-associated	0 (0%)	38 (86%)	38
Not handlebar-associated	12 (100%)	6 (14%)	18
TOTAL child bicyclists with abdominal or pelvic injuries	12 (100%)	44 (100%)	56

National annual estimates of child handlebar-related injuries:

The following estimates are based on the 19 State Hospital Discharge data, the Children's Hospital of Philadelphia Trauma Registry, and Census data. We estimate that each year about 1338 child bicyclists under 20 years of age in the United States suffer abdominal or pelvic organ injuries of severity AIS 2 or greater leading to hospitalization. 1040 of these children are injured in bicycle crashes not involving motor vehicles. We estimate that

894 of these injuries are associated with handlebars. The estimated associated costs of handlebar-related injuries each year in the U.S. are as follows:

Total direct hospital costs:	\$10,083,255
Total lifetime medical loss:	\$9,998,492
Total lifetime production loss:	\$10,971,884
Total lifetime monetized QALY's:	\$499,536,629

NOTE: These data are part of a manuscript that will be submitted for publication. For more details regarding the methods or results, please feel free to contact the authors.

Summary:

These analyses indicate a substantial incidence and cost associated with handlebar-related injuries. Handlebar-related injuries could potentially be avoided by designs that dissipate the impact force and distribute the force over a broader surface area. The knowledge that potential solutions exist combined with the substantial cost of handlebar-related injuries should spark discussion of the feasibility of implementing these solutions.

Manufacturers have long worked to improve the safety of their products. At times these safety improvements are slower in coming as is the case with handlebar-related injuries. The risk to child bicyclists related to handlebar impacts has been known for over thirty years. In such situations in which products continue to cause significant morbidity or mortality, voluntary or mandatory standards may be needed.

We hope that these analyses will help to inform your decision regarding the safety of bicycle handlebars for children.

Sincerely,

Flaura Koplin Winston, MD PhD
Michael L. Nance, MD
Cara Vivarelli-O'Neill, MPH

TraumaLink: The Interdisciplinary Pediatric Trauma Research Center at
The Children's Hospital of Philadelphia and
University of Pennsylvania

Hank Weiss, PhD, MPH
Stephen Strotmeyer, MPH

Center for Injury Research and Control (CIRCL)
University of Pittsburgh

HARLEM HOSPITAL INJURY PREVENTION PROGRAM

*Receipt
for address
pet*

30



Barbara Barlow, M.D.
Medical Director
bab1@columbia.edu

February 16, 2001

Aissatou Bey-Grecia
Director
ab21@columbia.edu

Sadye E. Dunn, Secretary
Consumer Products Safety Commission
Washington, DC 20207

Erik Cliette
Associate Director
ec221@columbia.edu

Benjamin Anagnos
Finance Director
ba58@columbia.edu

RE: Petition HP01-1, petition for bicycle handlebar performance standard

Dear Secretary Dunn:

This letter supports the petition for performance standards for bicycle handlebars. I am writing as the head of the Injury Free Coalition for Kidssm, an organization of hospital based injury prevention programs working with their communities to reduce injury through research, intervention, education, and advocacy. In addition, I am writing as a pediatric trauma surgeon and the chief of surgery at Harlem Hospital. In both capacities, I am in the unique position of seeing the injuries caused by handlebars but also am aware that there are community-based networks of injury prevention practitioners who will promote the use of safer handlebars if they were available. Unfortunately, no such safer handlebars exist. We have seen two serious accidents due to handlebars. One resulted in a ruptured spleen and the other a ruptured colon.

I work with the community in an on-going effort to bring the message of bicycling safety and helmet use to the children. These injury prevention measures can only go so far when a piece of the bike itself is the cause of the injury during a minor accident – like a fall.

I wholeheartedly support any efforts to minimize the risk of injury related to bicycle handlebars and think that regulating the performance of handlebars would be great advance. If I can provide any further information, please do not hesitate to contact me.

Sincerely,

Barbara Barlow, MD
Injury Free Coalition for Kids
Founder, Executive Director

506 Lenox Avenue, KP 17102, New York, NY 10037 tel (212) 939-4004 fax (212) 939-4015

www.injuryfree.org

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN



*Bicycle
handlebar
petition*
3/

April 16, 2001

Reply To:
Department of Federal Affairs
American Academy of Pediatrics
The Homer Building
601 Thirteenth Street, NW
Suite 400 North
Washington, DC 20005
202/347-8600
800/336-5475
Fax: 202/393-6137
E-mail: kids1st@aap.org
http://www.aap.org

Office of the Secretary
Room 501
Consumer Product Safety Commission
4330 East-West Highway
Bethesda, MD 20814

Re: Performance Standard for Bicycle Handlebars

To Whom It May Concern:

The American Academy of Pediatrics (AAP) is an organization of 55,000 primary care pediatricians, pediatric medical subspecialists, and pediatric surgical specialists dedicated to the health, safety, and well-being of infants, children, adolescents and young adults. On behalf of the Academy, I am writing in support of a Petition submitted to CPSC regarding a performance standard for bicycle handlebars posted in the Federal Register on February 14, 2001.

As noted in the petition, handlebar injuries can cause pancreatic, intestinal, renal, liver and/or splenic trauma. Since so many children are exposed to the risk of handlebar injuries and there is no other way to prevent them, the Academy supports the development of a mandatory standard for bicycle handlebars. Such a standard should include requirements to spread the force of impact over a larger surface area and pad potential points of impact in order to dissipate force.

Thank you for consideration of our support in conjunction with your review of this petition.

Sincerely,

Steve Berman, MD

Steve Berman MD, FAAP
President

SB/jp

Executive Committee

President
Steve Berman, MD

Vice President
Louis Z. Cooper, MD

Executive Director
Joe M. Sanders, Jr. MD

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Federal Way, Washington

Burton F. Willis, MD
Huntington Beach, California

Charles W. Linder, MD
Augusta, Georgia

Immediate Past President
Donald E. Cook, MD

Stevenson, Todd A.

*Wagner
Kawalek
pet
32*

From: Alexander Soutter [SOUTTEA@driscollchildrens.org]
Sent: Monday, April 16, 2001 3:39 PM
To: cpssc-os@cpssc.gov
Cc: nance@email.chop.edu
Subject: Petition HP01-1 Petition for bicycle handlebar performance standard



CSSFAX1.DOC

Sadye E. Dunn, Secretary

Consumer Product Safety Commission
Washington, DC 20207

Re: Petition HP01-1 Petition for bicycle handlebar performance standard

Dear Secretary Dunn,

This letter supports the petition for performance standards for bike handlebars. I am a practicing trauma surgeon at Driscoll Children's Hospital in Corpus Christi, Texas. I have witnessed firsthand the injuries that are caused by handlebars. In the last year alone, approximately eighteen children were hospitalized at Driscoll Children's Hospital due to injuries sustained after an impact with a handlebar; this represents about 60% of kids hospitalized for bike-related injuries.

One eight-year-old boy required removal of part of his spleen (and several blood transfusions) due to the severity of the blow he received from the handlebar of his bike. This was a direct result of the handlebar itself, since the accident was a minor one: the handlebar had concentrated the modest energy of the impact directly onto his spleen.

I wholeheartedly support any efforts to minimize the risk of injury related to handlebars, and I think the regulation of the performance of handlebars is a necessary - and long overdue -- step forward.

If I can answer any questions at any time, please do not hesitate to call me at (361) 694-4700.

Sincerely,

Alexander D. Soutter, MD

Alexander D. Soutter, MD
General, Thoracic and Urologic Surgery of Infants & Children
Assistant Professor, Texas A&M University
souttea@driscollchildrens.org

Children's Surgical Services
Driscoll Children's Hospital
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Corpus Christi, Texas 78411 USA
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www.driscollchildrens.org

Children's Surgical Services

Alexander D. Soutter, MD

15 April 2001

Sadye E. Dunn, Secretary
Consumer Product Safety Commission
Washington, DC 20207

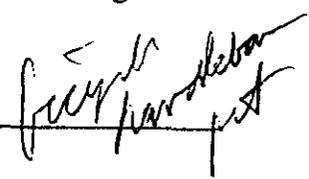
Re: Petition HP01-1 Petition for bicycle handlebar performance standard

Dear Secretary Dunn,

This letter supports the petition for performance standards for bike handlebars. I am a practicing trauma surgeon at Driscoll Children's Hospital and have witnessed firsthand the injuries that are caused by handlebars. In the last year alone, approximately eighteen children were hospitalized at Driscoll Children's Hospital due to injuries sustained after an impact with a handlebar; this represents about 60% of kids hospitalized for bike-related injuries.

One child required removal of part of his spleen (and several blood transfusions) due to the severity of the blow he received from the handlebar of his bike. This was a direct result of the handlebar itself, since the accident was a minor one: the handlebar had concentrated the modest energy of the impact directly onto his spleen.

I wholeheartedly support any efforts to minimize the risk of injury related to handlebars, and I think that regulating the performance of handlebars would be a great step forward

Stevenson, Todd A.

From: Cheryl Pozzi [mcpozzi@myexcel.com]
Sent: Monday, April 16, 2001 4:27 PM
To: cpsc-os@cpsc.gov
Subject: Fw: PETITION HP 01-1 BICYCLE HANDLEBAR PERFORMANCE
Importance: High
Subject: PETITION HP 01-1 BICYCLE HANDLEBAR PERFORMANCE STANDARD

Mark C. Pozzi
Sandia Safety Sciences
8 Paul Road
Cedar Crest, New Mexico 87008
505-281-1599 Fax 505-281-7464

April 16, 2001

Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207
EMAIL to cpsc.os@cpsc.gov

PETITION HP 01-1, BICYCLE HANDLEBAR PERFORMANCE STANDARD

BACKGROUND

I only learned about Dr. Winston's petition today. This response is being made in the hope that I can contribute some useful information that will stimulate discussion and action on this long-standing problem. I have not had an opportunity read her petition, nor to conduct normal research into existing safety studies, if any. I will follow up with more information as soon as possible.

I am a consulting safety scientist with over 30 years experience in bicycle-related safety and injury-causation. My background includes work as a vehicle crash test engineer and biomechanical safety analyst, on contracts for the National Highway Traffic Safety Administration, Federal Highway Administration, the Insurance Institute for Highway Safety, and the private sector. This includes investigation and analysis of vehicle occupant protection systems per various Federal Motor Vehicle Safety Standards, and the NHTSA Office of Defect Investigation. I have authored or contributed to approximately 200 transportation safety-related reports for the DOT, ranging from pedestrians through heavy trucks and trains. I have also co-authored a study on pediatric skull fracture.

My specific bicycle-related knowledge includes involvement in numerous bicycle accident investigations ranging from minor injuries through fatalities, participation in bicyclist crash testing, design and testing of bicycle components, and development of bicycles for the blind and disabled, through Olympic competition. Working as a bicycle mechanic, I have assembled and repaired many hundreds of bicycles ranging from children's sidewalk models through Olympic-level and experimental racing machines. As a bicycle racing safety official, I have worked at the World Championship level. As a cyclist, I have competed in virtually every kind of event, from 1000 meter sprints on fixed gear bicycles, through multi-day road stage races. As a professional coach I have coached at the Olympic and Professional level, developing over a dozen US Amateur individual and team National Champions, one US Professional Champion, one European Champion, and four World Record holders.

4/17/01

The phenomenon of bicycle handlebar-related injury goes back many decades, most probably since the bicycle was invented. Bicycle racing was popular worldwide prior to World War II, and remains very popular in Europe, Asia, and South America, with renewed interest in the USA since the early 1970's. Recreational bicycling remains one of the most popular forms of exercise in the USA, with participation in the millions. It remains an essential activity for millions of children, ranging from preschoolers onward.

Since at least the early 1970's, if not earlier, the U.S. Cycling Federation (and I believe the UCI, International Cycling Union) has mandated plugged or capped handlebar ends. At this time I do not know if this regulation was based on anything more than practical experience and anecdotal cases. The bottom line is that handlebar ends have been long recognized as a serious injury-causation mode in bicycle racing crashes.

OBSERVATIONS

While I am not a physician or nurse, I have had to treat numerous handlebar-induced injuries on myself, on teammates, and others. I have also seen the aftermath of these injuries in terms of severe lacerations, bruising, scars, and internal injuries. I personally incurred a severely bruised liver, and broken ribs, as a result of handlebar impacts. The etiology of handlebar injuries is similar in some respects to any impact with a relatively small, rigid, force-concentrating structure. Impact with an unplugged handlebar end can create severe, deep lacerations, often of a circular nature, which can be extremely difficult to repair effectively. In some instances there can be localized penetration of sufficient depth to damage internal organs, even if the outer body wall is not pierced.

Bicycles demonstrate a range of safety hazards related to handlebars, stems, and gearshift levers. Most inexpensive bicycles utilize handlebar stems with projecting stem expander bolt heads. Most high-quality bicycles utilize handlebar stems with recessed expander bolts to reduce the injury-causing potential of these parts. Almost all high-quality multi-speed bicycles have the gear shift levers located on the frame's down tube, and some have adopted handlebar twist-grip-actuated shifters. There are also handlebar end-mounted shift levers for racing-type bicycles, but these are relatively rare. These bar-end shift levers typically are secured by an expansion plug mechanism, which is very robust. There is the potential for force-concentration-type injury from these bar-end shift levers, especially if they are pointed directly rearward at the instant of contact. Most "mountain" bicycles utilize thumb-actuated handlebar-mounted shifters, located inboard of the bicycle handgrips. In some instances these also present a potential for force-concentration type injuries.

Many inexpensive multi-speed bicycles utilize a gearshift lever cluster mounted at the top of the headset, or on the handlebar stem. This location is less expensive because it reduces the length of control cables and also reduces the number of parts required. These present a hazard due to the projecting shift levers, which increase the likelihood of force-concentration injury to the abdomen and groin. Such levers should be relocated to an area of the bicycle, such as the down tube, which will most probably significantly reduce these hazards.

Some "BMX" type bicycles, and some small children's bicycles with riser-type handlebars, have a very narrow crossbar reinforcement approximately midway between the stem and handlebar grip level. This presents additional hazards to the head, neck, and internal organs. These narrow, force-concentrating structures should either be eliminated, redesigned, shielded and/or padded with dense, energy-absorbing durable padding which is not easily removable. At one time it was common to find soft rubber or plastic covers on bicycle shift levers as original equipment, even on less-expensive bicycles. This practice appears to have ceased as industry practice. Such covers would help to dissipate loading via energy-absorption, as well as distributing the load over a significantly greater surface area.

The foregoing Federal Motor Vehicle Safety Standards found in 49 CFR Part 571, includes FMVSS 201, Occupant Protection from Interior Impact. The provisions of that standard include padding of certain structures for impact attenuation, removal or minimization of projections within the vehicle occupant compartment, and minimum sizes for certain projections such as transmission operating handles, etc. The purpose of FMVSS 201 is to eliminate small, projecting, rigid force-concentrating structures, such as control knobs or levers, which can be impacted by vehicle occupants in a collision. The padded dash panel is designed to attenuate head injuries when striking the vehicle interior. Even in vehicles meeting these minimal standards, I have seen vehicle occupants with thoracic, head, and extremity penetrations by transmission operating handles, liftgate mounts, wing vent and door handles, and various control knobs.

The principle of a force-concentrating structure can be demonstrated with a simple wooden pencil. Place the side of a pencil against the palm of your hand, and then push vigorously on the pencil against that hand. The pencil will exert no injurious loading. In most people, the pencil will break before one even feels significant loading. The force is distributed over a relatively large area, and there are no sharp edges acting upon the body. Taking the pencil's eraser end, and applying the same load against the same hand, one can feel a dramatic increase in force concentration. Because the rubber eraser is blunt and has energy-absorbing capacity, it will dissipate the load over a much smaller area than the side of the pencil. One might be able to cause localized bruising if the force were very high, however skin penetration and serious injury is still unlikely. Taking the sharp pencil point, and applying the same force, one can easily cause injury, or even pierce through the hand. What changed? Same hand, same direction and amount of force, same pencil. The pencil point is a force-concentrating structure, which dramatically reduces the threshold of injury for a given amount of load.

It has been known since the 1890's that when the human body is exposed to concentrated areas of impact, the type and severity of injury can increase dramatically. For example, compare a head strike on a flat, rigid surface of unlimited area such as a roadway, to an identical head strike on a force-concentrating structure like an unpadding handlebar end or shift lever. For a given impact load to the head, instead of incurring a linear skull fracture, one might incur a localized depressed fracture, or a punch-through fracture. Because of the increased likelihood of brain trauma, both of the latter types of fracture are more hazardous than a linear fracture, all else being equal. There is additional hazard to the eyes and other soft tissues, which would normally be shielded by the contours of the skull. Handlebar ends can overcome the protective capabilities of many helmets, because of openings in the helmets, as well as the fact that they are designed primarily to deal with impacts to broad, relatively flat surfaces, not spear-like objects. An exposed bicycle handlebar end has the added potential of sharp edges that can cut tissue. Even high-quality aluminum racing bicycle handlebars have these sharp edges. I have encountered inexpensive bicycles with handlebar ends so sharp that I incurred cuts while unpacking them from their shipping containers.

Typical bicycle handlebars are formed from steel or aluminum tubing. They may have a reinforcing section added where they meet the handlebar stem. The bar ends are typically smooth inside and out, with no provision for mechanically securing bar-end protection. There are typically no internal or external threads, knurling, barbs, flanges, holes, or other means built into the handlebar as a means of mechanically securing bar end plugs or caps. Adhesives are typically not used, because the handlebar end plug should be a removable, reusable, durable device. The difference between that design theory and real-world practicality is quite large, however.

Handlebar end plugs are typically friction-fit, inexpensive plastic parts. They must often accomplish the contradictory task of having a loose-enough fit to allow securing the end of handlebar tape, while remaining tight enough to remain in place for years. These friction-fit plugs must typically be pried out for replacement of handlebar tape, which often leaves them damaged or otherwise useless. Some

higher-quality racing-type bicycles come with very thin plastic bar-end plugs or caps which are held in place by adhesive tape, then are overlaid with handlebar tape. These bar end plugs and caps typically do not have any provision for significant energy absorption, nor do they increase the surface area of the handlebar end to reduce force-concentrating impacts. With few exceptions, most bar end plugs maintain approximately the same diameter as the handlebars. Adult-sized bicycles typically have handlebars that are approximately one inch or less in diameter at the ends. Smaller children's bicycles often have handlebars that are much smaller diameter, thus increasing the force-concentration factor. This often falls below the acceptable range of contact area set forth in FMVSS 201.

None of the foregoing handlebar end plugs have any provision to remain positively attached and functional during foreseeable impact loading. All are susceptible to being pulled out and/or damaged while a bicycle is sliding on the road surface during a crash, or while the rider is trying to hang onto the end of the handlebar. The uncovered handlebar end can thus ultimately be exposed to the rider's body during a crash, even if the handlebar end was covered at the beginning of the crash. Some "mountain" bicycles and "BMX"-type bicycles use a handlebar end grip, which covers the last several inches of the handlebar. These typically utilize the large contact area of the grip/handlebar interface to maintain frictional contact, and they often require the assistance of hot water and/or lubricants such as soapy water to mount or remove. Some of these handlebar grips contain an extended, wider area on the distal end, which significantly decreases the potential force-concentration properties of these handlebars.

DISCUSSION AND RECOMMENDATIONS

Bicycle handlebars in their current state of design, pose a significant safety hazard in virtually all bicycle fall and collision modes. Bicycle handlebars and stems, and some shift levers, are the most likely bicycle components to be struck by vulnerable body parts during a typical fall or collision. This can occur whether or not the hands remain on the handlebars. Racing cyclists are taught that when a crash has begun, to release the handlebars, cover the head and neck with the arms, and attempt to "tuck and roll" to minimize injury to the head and neck. These bicycle components are essentially free to interact with the unprotected chest, abdomen, groin, and legs.

There is a practical limit as to the size of handlebar and shift lever ends, however even modest increases in diameter could have significant benefits. Increased handlebar end size could also be used as a means to improve hand grip retention. Handlebar end caps or plugs should be installed in a manner that allows reasonable removal and replacement, without causing damage to the end cap or plug. For those types of handlebar ends relying on friction or adhesives to maintain a secure position in or on the handlebar, means should be taken to significantly increase the contact surface area and frictional interface. Handlebar ends should be designed to allow removal and reinstallation with common tools, and without degradation of the handlebar end cap or plug function.

Approximately 25 years ago I encountered one type of racing bicycle handlebar end plug made of dense rubber, which was an order of magnitude safer and more reliable than the foregoing designs. These bar end plugs used a threaded internal expansion plug to provide a very secure fit inside the handlebar, much like the mechanism used to secure a handlebar stem inside the steering tube of the bicycle frame. These could not be pulled out even under crash conditions. They had the added safety feature of a thickened, raised rim that shrouded the end of the handlebar. These were found on an Italian road racing bicycle. Unfortunately I haven't seen any of these plugs since that time.

Handlebar ends should be made of robust materials that will withstand normal wear and tear and environmental degradation, as well as providing a secure, effective means of energy absorption and dissipation. Simple holes drilled in the handlebar tubing would provide opportunities for projecting bosses or spring-loaded plugs, which would help insure retention of bar end caps or plugs. This

approach has the added benefit of being retrofit to the millions of existing handlebars.

I would welcome the opportunity to participate in further discussion or research on this topic. Some case study material, which supports my comments, is available for review upon request. Thank you for the opportunity to comment on this safety issue.

Yours truly,

Mark Pozzi MS FACFE

Stevenson, Todd A.

From: D. Grossman [navajo@u.washington.edu]
Sent: Saturday, April 28, 2001 3:04 PM
To: Stevenson, Todd A.
Subject: RE: Petition HP 01-1, Petition for Bicycle Handlebar Performance Standard

*Wagner
handlebar
He will be
sending
the comment
you want*

OK. I'll do that. Sorry they did not come through well on email.

David C. Grossman, MD, MPH
Director
Harborview Injury Prevention and Research Center

Associate Professor
Department of Pediatrics
Harborview Medical Center
University of Washington

Mailing Address:
325 Ninth Ave. Box 359960
Seattle, WA 98104

voice: 206.521.1537
fax: 206.521.1562

On Thu, 26 Apr 2001, Stevenson, Todd A. wrote:

- > Please send your comment in hard copy if you have not already. The
- > transmission of the excel sheets have not been successful at this end. We
- > have received a garbled set of several pages of letters and numbers, but no
- > charts.
- > Mail to: Bicycle Handlebar Petition Comments
- > Office of the Secretary
- > Consumer Product Safety Commission
- > Washington, DC 20207
- >
- > or have delivered to
- > 4340 East West Highway, Room 502
- > Bethesda, MD 20814
- >
- > Todd Stevenson, Office of the Secretary
- >
- >

> -----Original Message-----

> From: D. Grossman [mailto:navajo@u.washington.edu]
> Sent: Friday, April 13, 2001 2:38 PM
> To: Stevenson, Todd A.
> Subject: Petition HP 01-1, Petition for Bicycle Handlebar Performance
> Standard

> To: Office of the Secretary
> U.S. Consumer Product Safety Commission

> I am writing to comment on the above named petition, on behalf of the
> Harborview Injury Prevention and Research Center at the University of
> Washington.

> We have examined our data from bicycle injuries from our trauma registry,
> and have found that a reasonably high proportion of the injuries that lead
> to admission at our Level I trauma center have associated chest or
> abdominal injuries. Many of these injuries are likely related to abdominal
> and/or thoracic impact with the
> handlebars. Examples of these injuries include lacerations and contusions
> of the liver, spleen, pancreas, lung, some of which can be

> life-threatening. As a
 > pediatrician who treats trauma patients, I can attest to the fact that I
 > have personally seen these types of injuries on a recurrent basis.
 >
 > I have attached an Excel spreadsheet of the data from our trauma center,
 > looking at both children under 15 and under 16 years of age.
 >
 > We support the petition's request regarding the need for a performance
 > standard for bicycle handlebars.
 >
 > Please do not hesitate to contact me if we can be of assistance.

> Sincerely,

>
 > *****
 > David C. Grossman, MD, MPH
 > Director
 > Harborview Injury Prevention and Research Center
 >
 > Professor
 > Department of Pediatrics
 > Harborview Medical Center
 > University of Washington
 >
 > Mailing Address:
 > 325 Ninth Ave. Box 359960
 > Seattle, WA 98104
 >
 > voice: 206.521.1537
 > fax: 206.521.1562
 > *****

> ----- Forwarded message -----
 > Date: Tue, 27 Feb 2001 17:04:52 -0800
 > From: Susan Pilcher <pilcher@u.washington.edu>
 > To: David Grossman <navajo@u.washington.edu>
 > Subject: bike injuries

> David,
 > I've attached an excel sheet with this table (< 15 y/o) plus a < 16 y/o. If
 > you have questions or this is Not what you had in mind let me know. Susan

> Bicycle Injuries in Children < 15
 > period: 1986-YTD2001

> criteria: etiology = bike only
 > age < 15
 > ER disp = Admitted or Died-in-ER
 > abd/chest = AIS > 0 in ISS abd/chest region

> %	> Year	> Total Bike	> Total Bike w chest or abd injury
>	> 1986 19 1	> 5.3%	
>	> 1987 26 4	> 15.4%	
>	> 1988 26 6	> 23.1%	
>	> 1989 35 9	> 25.7%	
>	> 1990 16 5	> 31.3%	
>	> 1991 31 5	> 16.1%	
>	> 1992 31 3	> 9.7%	
>	> 1993 29 6	> 20.7%	
>	> 1994 42 3	> 7.1%	
>	> 1995 43 3	> 7.0%	
>	> 1996 57 8	> 14.0%	
>	> 1997 40 10	> 25.0%	
>	> 1998 46 6	> 13.0%	
>	> 1999 45 8	> 17.8%	
>	> 2000 50 10	> 20.0%	
>	> (ytd) 2001 1 0	> 0.0%	
>	> total 537 87	> 16.2%	

Stevenson, Todd A.

To: D. Grossman
Subject: RE: Petition HP 01-1, Petition for Bicycle Handlebar Performance Standard

Please send your comment in hard copy if you have not already. The transmission of the excel sheets have not been successful at this end. We have received a garbled set of several pages of letters and numbers, but no charts.

Mail to: Bicycle Handlebar Petition Comments
Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207

or have delivered to
4340 East West Highway, Room 502
Bethesda, MD 20814

Todd Stevenson, Office of the Secretary

-----Original Message-----

From: D. Grossman [mailto:navajo@u.washington.edu]
Sent: Friday, April 13, 2001 2:38 PM
To: Stevenson, Todd A.
Subject: Petition HP 01-1, Petition for Bicycle Handlebar Performance Standard

To: Office of the Secretary
U.S. Consumer Product Safety Commission

I am writing to comment on the above named petition, on behalf of the Harborview Injury Prevention and Research Center at the University of Washington.

We have examined our data from bicycle injuries from our trauma registry, and have found that a reasonably high proportion of the injuries that lead to admission at our Level I trauma center have associated chest or abdominal injuries. Many of these injuries are likely related to abdominal and/or thoracic impact with the handlebars. Examples of these injuries include lacerations and contusions of the liver, spleen, pancreas, lung, some of which can be life-threatening. As a pediatrician who treats trauma patients, I can attest to the fact that I have personally seen these types of injuries on a recurrent basis.

I have attached an Excel spreadsheet of the data from our trauma center, looking at both children under 15 and under 16 years of age.

We support the petition's request regarding the need for a performance standard for bicycle handlebars.

Please do not hesitate to contact me if we can be of assistance.

Sincerely,

David C. Grossman, MD, MPH
Director
Harborview Injury Prevention and Research Center

Professor
Department of Pediatrics
Harborview Medical Center
University of Washington

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Tracey Newman-Jaco
9005 East 90th Terrace
Kansas City, Missouri 64138

May 15, 2001

Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207

Re: Petition HP 01-1, Petition for Bicycle Handlebar Performance Standard

As a parent of two small children I am compelled to submit a comment regarding the petition to regulate the safety of handlebars on bicycles. After reading the results of the study performed by Drs. Winston, Shaw, Kreshak, Schwarz, Gallagher, and Cnaan, I can see no other alternative but to enact this proposed regulation. The studies done on this subject draw a clear picture of how bicycle handlebars and severe injuries in juvenile bicyclist are related, and thus some action must be taken to reduce the instances of injury.

Dr. Flaura Koplin Winston asserts that there is a "discordancy that exists between the apparently minor circumstances and serious injuries sustained by child bicyclist who impact bicycle handlebars." Not only is there an inconsistency between seemingly minor bicycle accidents and the major injuries they cause, but it is often difficult to detect these injuries until the patient comes back with complaints of abdominal pain, fever, and vomiting. In some cases what appeared to be simple scrapes and bruises turned out to be life-threatening injuries that went undetected at the initial emergency room visit.

I think it is important to note that the types of accidents that lead to these injuries are common occurrences when riding a bicycle, especially when you are dealing with children. Dr. Winston describes simple accidents such as hitting a bump in the sidewalk, braking suddenly, performing a stunt, and a popped chain as some examples of incidents presented in her research. It is frightening and inconceivable to me that hitting a bump on the sidewalk and falling off a bicycle could result in my child requiring surgery for abdominal injuries such as the ones described in her study.

From the research on this subject we are told that the two most commonly cited mechanisms for pancreatic trauma in children include motor vehicle crashes and bicycle handlebar injuries. Dr. Caroline Acton found that in her study of 813 children with bicycle injuries, 41 children sustained non-penetrating abdominal trauma due to a bicycle incident. Out of those 41 cases bicycle handlebars caused 21. Of the 21 cases, 10 were life threatening.

In his study Dr. Marc Arkovitz also concluded that that bicycle handlebars are the most frequent cause of the most severe pancreatic injuries. In a study consisting of 1,271

patients seen for abdominal trauma, bicycle handlebars caused 27%, making them the most common cause of abdominal trauma. The study also found that 71% of those patients sustaining bicycle handlebar injuries required operative intervention.

According to the research by Arkovitz, a high-energy crushing force directed at the upper abdomen, produces these injuries. The injuries occur when a child contacts the handlebar of the bicycle, causing a forward-localized compression of the epigastrium. This compression can produce an injury to the pancreas, including possible ductal transection or disruption. Because the abdominal wall is thinner and there is a limited amount of protective muscle and subcutaneous fat the susceptibility to injury is increased.

Drs. Clarnett and Beasley conducted a retrospective review of all the children admitted to the Royal Children's Hospital with handlebar injuries between January 1990 and January 1995. Thirty-two children with blunt abdominal trauma or lacerations resulting from handlebar injuries were identified. Injuries included: splenic trauma and liver trauma to mention a few. Thirteen operations were performed and the average hospital stay was about 9 days. Of particular concern, the retrospective review states that the presence of external bruising was a poor indicator of underlying organ damage.

Drs. Clarnette and Beasley also concluded from their research "the infrequent finding of external bruising in the presence of major organ damage suggests that, although the velocity at impact may be relatively low, the small cross-sectional area of the end of the handlebar is a major factor contributing to organ damage." They also suspect that the high proportion of lacerations observed in this type of abdominal trauma result from the sharp metallic end of the handlebar cutting through the soft rubber handle. They also suggested that manufacturers of bicycles should be made aware of these findings and should adjust the design of the handlebars accordingly.

As result of her study, Dr. Winston suggest exploring limitations of rotation of the front wheel and curving handlebar ends away from the rider to redistribute some of the force and lessen the degree of injury sustained in these accidents. She also suggests padding the handlebars ends. Educating parents in proper sizing of the bicycle to the size of the child and appropriateness of the type of bicycle for the child's age and skill level are also aspects of her injury-reducing proposal.

As you can clearly see the evidence is overwhelming in linking the serious abdominal injuries to bicycle handlebars. It is imperative that this research be taken seriously and steps to make bike riding for children safer must be a priority. As Dr. Winston states, I think there is a need for more research in this area, particularly in defining exactly what changes need to be made to handlebars to provide the highest level of safety.

When making the decision to enact this regulation or not, please consider how many children could potentially be spared possible life threatening injuries. After looking at the seriousness and severity of the injuries caused by bicycle handlebars, I hope this petition will inspire the Consumer Product Safety Commission to initiate a

process that will be as successful as what was used in developing and implementing bicycle helmet use after researchers documented the mortality and morbidity associated with head injuries in bicyclists. I do realize that changing the handlebars on bicycles will not prevent all serious injuries, but I do believe that the number injuries that this type of regulation will prevent are well worth the effort. Thank you for your time.

Sincerely,

Tracey Newman-Jaco