Hospital CPS Discharge Policy Project

Report on the Evidence for Addressing Child Passenger Safety Issues as a Part of Hospital Discharge Planning

This “evidence report” is an attempt to provide readily accessible answers to major questions regarding the current state of child passenger safety (CPS) around discharge from US hospitals. We have used existing available evidence to answer key questions developed for this effort. Typical sources of this evidence includes resources of the National Highway Traffic Safety Administration (NHTSA), the National Safety Council (NSC), Safe Kids Worldwide, National Association of Children’s Hospitals and Related Institutions (NACHRI), the American Academy of Pediatrics (AAP), the Centers for Disease Control and Prevention (CDC), and other organizations with a significant history of involvement and expertise in this topic area, as well as published research on the topic. The answers to the following questions are not based on original data collection, but a mining of existing and readily accessible information on the topic. Some of the questions cannot be answered based on existing research, but the proposed CPS Discharge Survey and case studies could provide great insight into these topics.

1. Why should hospitals care about child passenger safety? Why is child passenger safety important?

Motor vehicle crashes are the leading cause of death and a major cause of morbidity, including long term disability, for US children. Injury related to motor vehicle crashes is the leading killer of children and is the leading single cause of death for children after the age of 2 years in the US currently.\(^1\) According to NHTSA’s Fatality Analysis Reporting System, there were 1,662 children under 16 years of age killed in crashes as motor vehicle occupants in 2006.\(^2\) Another 5,320 motor vehicle occupants aged 16-20 were killed. A total of 212,000 child occupants under 16 were injured in crashes, and 396,000 occupants aged 16-20 years were injured.\(^2\) Direct medical costs were estimated over a decade ago to be $3 billion\(^3\) and would be expected to be higher today.

In 2005, 450 children under age 5 died in motor vehicle crashes; one-third of these children were completely unrestrained (26% of infants and 36% of children aged 1 to 4 years). An additional 9% of the fatalities were in children who were restrained in adult seat belts.\(^4\) However car safety seats are a tremendously effective intervention. Car safety seats reduce fatal injuries by 71% for infants and 54% for children aged 1 to 4 years.\(^5\) For children aged 4 to 7 years, booster seats reduce the odds of injury by 59% compared to use of seat belts alone.\(^6\) The National Highway Traffic Safety Administration (NHTSA) estimates that in 2005 the lives of 420 children under age 5 were saved by car safety seats and that if all children in that age group had used car safety seats, an additional 98 lives could have been saved.\(^4\) Although a majority of children under age 8 ride in car safety seats or seat belts, many of them are riding in the wrong type of restraint for their age.\(^7\) In addition, a recent study of over 5,500 children in more than 4,000 vehicles showed that 72.6% of car safety seats were misused in some critical way that would be expected to raise the child’s risk of injury in a crash.\(^8\)
Protecting child passengers is in keeping with the missions and goals of hospitals, to keep children healthy. Health and safety promotion fits perfectly into the societal expectations of hospitals. Hospitals can serve a role in the promotion of proper child passenger protection from the first discharge from the hospital to all future episodes of exposure at a hospital.

2. What can hospitals do regarding child passenger safety? What approaches have hospitals adopted to discharge policy and documentation? How many other hospitals are already doing this? Are these efforts effective?

The AAP policy statement “Safe Transportation of Newborns at Hospital Discharge” published in 1999 called for hospitals to “set policies that require the discharge of every newborn in a car safety seat that is appropriate for the infant’s maturity and medical condition. Discharge policies for newborns should include a parent education component, regular review of educational materials, and periodic in-service education for responsible staff.”

Information regarding the compliance with AAP recommendations is scant. We are unaware of any compilation or summary of general or children’s hospitals in the United States and the presence or specifics of hospital discharge policy regarding child passenger safety.

Following the publication of the AAP policy statement, researchers at the University of Nebraska at Omaha evaluated the effectiveness of a statewide educational intervention to promote the adoption of hospital discharge policies specific to child passenger safety. They found:

All hospitals providing newborn services in Nebraska were surveyed prior to and after the intervention to determine the nature and extent of their CSS discharge policies, patient education programs and loan programs. Post-intervention data indicate significant increases in the percentage of hospitals having formal infant CSS discharge policies (from 25.9% to 88%), providing CSS patient education (from 51% to 95%), and having safety seat loan/give-away programs (from 59% to 76%).

While the educational intervention appears to have been effective in increasing the number of hospitals that have written policies regarding child passenger safety, this study did not address the effectiveness of having a written policy on proper child passenger restraint at the time of discharge or at any time after discharge, and did not examine injury or death outcomes.

In 2002, The Injury Prevention Section of the Michigan Department of Community Health conducted a written survey of all 103 Michigan hospitals that deliver newborns. The survey was designed to:

- Identify a CPS contact at each hospital.
- Gather information regarding existing child safety seat discharge policies.
- Identify current hospital-based CPS activities.
- Determine how many hospitals have NHTSA-Certified CPS Technicians on staff.

Survey data from 73 of 103 returned surveys suggest several key trends including:

- Majority of hospitals do not have a formal, written child safety seat hospital discharge policy. Very few have a policy specifically addressing newborns or infants with special needs.
- Policies that are in existence are limited in scope. Child safety seat discharge language is usually found in one to two sentences of a larger newborn discharge policy.
- Policy enforcement is highly variable among, and possibly even within, hospital facilities.
- At least some child safety seat education takes place in the majority of childbirth preparation classes offered by hospitals and to mothers of newborns during hospital stays.
- Due to liability issues, hospitals are very cautious about child safety seat education and the assistance provided to parents.
- Few hospitals have NHTSA-Certified CPS Technicians on staff although plans to certify staff (or interest in staff certification) are expressed by many hospitals."

A few specific examples are available from Internet searches. For example, the Pennsylvania state chapter has created a document summarizing the state’s law regarding child passenger restraint, and encouraging hospitals to establish hospital discharge policy regarding newborn and older child hospital discharges. This document includes sample policy language for use by individual hospitals.

In 2005, the State of Montana’s Department of Transportation was funded by NHTSA to conduct an Occupant Protection for Children assessment. The final report for that assessment concluded that with regard to child passenger safety as it relates to hospital discharge, “There appears to be no standard hospital discharge policy adopted throughout the State.”

Many hospitals have established low cost car safety seat programs and loaner programs for families. Others have established safety centers in the hospital for families to purchase car safety seats and other child safety items; these are often associated with the pediatric emergency department. While there have been some evaluations of safety centers providing information on the number of items sold or the self-reported ownership or use of the items beyond the time of purchase, we could find no recent rigorous evaluation that provided evidence of the effectiveness of these interventions on observed car safety seat use or preventing child passenger injury. Several controlled trials from the 1970s and 1980s demonstrated improvement in car safety seat use after exposure to educational or loaner programs. These were summarized by DiGuiseppi.

3. How much does it cost hospitals to address child passenger safety? Are child passenger safety efforts reimbursable? Are there billing codes that can be used for child passenger safety activities? Are there ways for car safety seats to be considered medical equipment?

Costs associated with personnel and the costs of the car safety seats are the two main costs to hospitals to address child passenger safety at the time of discharge. In some settings, there may be significant issues related to the storage of seats as well. Goldstein, et al. from the Children’s Hospital of Philadelphia, provided a cost effectiveness analysis of car safety seat assessment, education and distribution programs in low income populations in the clinical setting. That report found:

The adoption of a CRS [Child restraint system] disbursement/education program could prevent up to 2 deaths, 12 serious injuries, and 51 minor injuries per 100 000 low-income children annually. When fully implemented, the program could save Medicaid over $1 million per 100 000 children in direct medical costs while costing $13 per child per year after all 8 years of benefit. From the
The study concluded that the “implementation of a Medicaid-funded CRS disbursement/education program was comparable in cost-effectiveness with federal vaccination programs targeted toward similar populations and represents an important potential strategy for addressing injury disparities among low-income children.”

This report was based, in part on experience at the University of Chicago. In 2007, Quinlan, et al. reported an evaluation of a pilot program providing car safety seat checks at the time of a well-child visit in a low-income community served by a Federally Qualified Health Center. This evaluation demonstrated that significant non-use remains in this low-income population, misuse is universal, and an exposure to the intervention was associated with promoting the use of car safety seats among non-users and more proper use among baseline car safety seat users.

In the 1999 policy statement “Safe Transportation of Newborns at Hospital Discharge” the AAP called for car safety seats to be “a benefit of coverage by Medicaid, managed care organizations, and other third-party insurers. Until that time, hospitals are encouraged to have a giveaway or loan program for parents who cannot afford to purchase a car seat.” This has been reiterated in the piece by Goldstein, the article by Quinlan, and others. We are not aware of any serious progress made in this regard in changing public and private insurers’ policy on Durable Medical Equipment coverage.

Less attention has been paid to the issue of personnel cost for Child Passenger Safety Technicians to provide the services required in a responsible education/distribution program. Quinlan, et al. call for a change in Centers for Medicare and Medicaid Services policy to allow reimbursement for CPS technicians’ services. We are aware of one abstract that reported South Carolina’s experience with being able to bill Medicaid in that state for CPS Technician services. This was presented at a national meeting by Leroy Frazier from the South Carolina Department of Health and Environmental Control. The abstract describes South Carolina’s Kids Riding Safely program. In this program, local health departments provided an average of 45 minutes of counseling to clients on child passenger safety and were able to successfully bill Medicaid for this service. The abstract reads “The South Carolina Family Support Services program allows Medicaid to be billed for services rendered to Medicaid clients when an assessment reveals child passenger safety education is needed.” This provided enough funds to cover staff time, travel expenses, overhead, and car safety seats. Despite multiple attempts to gather more information directly, it appears Mr. Frazier has moved on to another position, and we have had no success at getting further information on this issue. The abstract remains unpublished to our knowledge.

4. What resources are available to help hospitals set up child passenger safety policies or programs? What resources are available to help sustain these efforts? How do hospitals connect, both formally and informally, to child passenger safety resources in their communities (e.g., local Child Passenger Safety Technicians)?

A number of easily accessible resources can help hospitals set up child passenger safety policies and programs. The AAP policy statement “Safe Transportation of Newborns Discharged from
the Hospital” called for such policies in 1990\textsuperscript{21} and again when the revised statement was published in 1999.\textsuperscript{9} This resource provides some details on what a hospital discharge policy should include, but it is specific to newborns rather than older children being discharged from the hospital.

One example of a hospital discharge policy that covers children older than the newborn period was developed by the Pennsylvania state chapter of the AAP.\textsuperscript{12} California Department of Health Services has also developed a sample policy for that state specifically related to the California law requiring education of families with children younger than 6 years old being discharged.\textsuperscript{22} Little other readily accessible information is available on the components of a “standard” policy regarding safe transportation of children of all ages at the time of hospital discharge.

Multiple sources exist to assist hospitals to connect with their local CPS Technicians. Perhaps the most direct is www.seatcheck.org (or 1-866-SEAT-CHECK) and its inspection station locator based on zip code. This was created and maintained by Chrysler, NHTSA, the National Safety Council, Graco Children's Products Inc., Toys"R"Us and Babies"R"Us. In addition, local CPS Technicians can be identified through the National Child Passenger Safety Certification Training Program operated by Safe Kids Worldwide (see www.safekids.org/certification/).

5. \textbf{How can hospitals benefit by addressing child passenger safety?}

Many hospitals have used their car safety seat activities in promoting their facilities and in evidence of being “good citizens.” Marketing campaigns sometimes use car safety seat services for the promotion of a hospital. Organized car safety seat check events frequently promote a specific hospital providing care to children. Mott Children’s Hospital in Ann Arbor, Michigan is one example.\textsuperscript{23}

Providing community benefit is required for hospitals to be tax-exempt charitable organizations under section 501(c)(3) of the Internal Revenue Code. This may take the form of charity care or other community benefit such as community health improvement services and community benefit operations, health professions education, subsidized health services, cash and in-kind contributions to community.\textsuperscript{24}

Providing services related to child passenger safety of the community may serve as evidence of community benefit for IRS reporting. Multiple examples of hospitals claiming car seat-related services as community benefit are easily found; these include:

- Packard Children’s Hospital at Stanford, Palo Alto, California.\textsuperscript{25}
- St. Luke’s Hospital in south central Idaho, which includes car safety seat check services as part of its community benefit:\textsuperscript{26}
- AnMed, a hospital in Anderson, South Carolina, which includes car safety seat-related services as part of its community benefit.\textsuperscript{27}

No examples that we found involved child passenger safety services specifically at the time of hospital discharge, but we could find no information to suggest that there is any reason to believe
that such services provided at the time of hospital discharge would not be considered community benefit.

6. By addressing child passenger safety, do hospitals expose themselves to additional liability? How can that risk be managed? Has any hospital been sued for a child passenger safety-related claim? Which has greater potential liability—doing nothing or doing something to address child passenger safety? What are the legal implications of sending a child home unrestrained or improperly restrained? What if the family signs a waiver? How do the liability implications differ based on the services provided (i.e., education vs. installation)?

According to a report in the March 14, 1996 Reading Eagle/Reading Times (PA), Reading Hospital was sued by a couple whose 20 day-old-baby died in a crash while being restrained in the front seat. The couple claimed they saw the video “Getting It Right” which advised parents not to place the baby in the back seat alone. The family had the baby in a rear-facing car seat in the front seat and argued in the suit that the video should not have recommended having the baby travel in the front seat, and that the baby may have lived had she been in the back seat. The outcome of this suit is not known.

The staff of the AAP Bakwin Library were unable to locate any further information on CPS-related liability, including any examples of hospitals being sued for CPS-related claims, in the legal literature.

According to the resource guide produced by the California Department of Public Health “Child Passenger Safety: The Health Care Connection (Are You in Compliance?),” A hospital, clinic, or birthing center may be considered negligent if it:

- provides the parent, guardian, or designated agent with erroneous information;
- improperly instructs the parent, guardian, or designated agent on the use of a child safety seat;
- distributes child safety seats that do not meet federal standards, are damaged, or have been involved in a collision; or
- fails to provide the required child passenger safety information.

The same resource guide provides the following suggestions to minimize risk:

- Develop a hospital policy.
- Determine if current liability insurance covers the child passenger safety program, and make every effort to obtain adequate insurance.
- Ensure that all personnel disseminating information are well-trained by an agency with technical expertise in child passenger safety (contact your local health department for assistance). The field of child passenger safety is constantly evolving, and new issues are constantly emerging, so staff should receive training at least annually.
documentation of staff trained, who provided the training, and copies of training materials.

- Keep files of all materials disseminated to parents and any checklists used in the training of parents, and have the parents sign an agreement that they will use the child safety seat according to the manufacturer’s instructions. Keep the agreement on file.

- Document on the patient’s chart what health education materials were provided and the content of discussions on child passenger safety.

- Examine all child safety seats before they are loaned or given to a parent, legal guardian, or designated agent. Document the examination and photograph the child safety seat. Damaged or defective seats should never be distributed.

- Provide a copy of the manufacturer’s manual when distributing a child safety seat to parents, legal guardians, or a designated agent. This procedure should be carefully documented and kept on file.

- Provide accurate information and document the guidelines used for recommendations and the resources from which the guidelines were adapted when distributing child safety seats for infants and children with special needs.

7. **Are there currently any legal or accreditation requirements for hospitals to address child passenger safety?**

California is the only state we are aware of that legally requires hospitals to address child passenger safety with patients and their families. Specifically,

California state law requires all hospitals, clinics, and birthing centers to provide and discuss information on child passenger restraints before they release children younger than six years old or weighing less than sixty pounds. Additionally, the law requires, as a condition of licensing, that facilities have a written policy relating to the dissemination of child passenger safety information.  

This law was enacted in January 1996 and covers public and private hospitals, clinics, and birthing centers. As a condition for licensure, each must have a written policy on the dissemination of child passenger restraint systems information to parents or persons to whom a child is released. The law makes explicit the information that should be discussed with the caregivers of every child younger than 6 years old or weighing less than 60 pounds. This information is:

1. A summary of current state laws requiring child passenger restraint systems to be used when transporting children in motor vehicles.

2. A listing of child passenger restraint systems programs located within the county (prepared by local health departments in conjunction with the Office of Traffic Safety as required by Vehicle Code Sections 27360 and 27362).

3. Information describing the risks of death or serious injury associated with failure to use a child passenger restraint system.

A hospital may satisfy the above requirements of this paragraph by reproducing for distribution materials describing the risks of injury or death as a result of the failure to
utilize passenger restraints for infants and children, as provided, without charge, by the Department of the California Highway Patrol. A hospital that does not have these materials but demonstrates that it has made a written request of the California Highway Patrol is in compliance with the law.

There are child passenger safety laws in all 50 seats that have varying upper age limits, but all include the newborn and infancy period. Other than California’s law, none of the state laws have provisions specifically related to hospital discharge.

Child passenger safety is addressed to some extent in the accreditation of residency training programs in the United States. The accreditation of pediatrics residency programs (as well as all other residency programs pertinent to child passenger safety, such as family medicine residency) is performed by the Accreditation Council on Graduate Medical Education (ACGME). The ACGME is a private, not-for-profit council that accredits residencies through its Residency Review Committees (RRCs). There are explicit requirements for residency programs for each specialty. For pediatric residencies, the ACGME requirements include “preventive measures, including immunization schedules and safety issues, such as counseling parents on the importance of infant safety seats and knowledge of normal infant nutrition, including breast feeding and knowledge of normal newborn growth and development.”

For Family Medicine residency programs, the requirements are not as clear or specific. For accreditation by ACGME, family medicine programs are required to “demonstrate community-based disease screening, prevention, [and] health promotion.”

These requirements only apply to teaching hospitals with pediatric and family medicine residency programs.

The Joint Commission is the independent, not-for-profit body that accredits over 15,000 hospitals and other health care facilities in the United States. We were unable to find any information suggesting that child passenger safety has been addressed in the Joint Commission’s accrediting process.

8. Who at the hospital should be involved in child passenger safety (education, installation, testing)? What training do they need to have? What models of care exist? What are the expectations for staff instructions to parents? Who should lead child passenger safety efforts at the hospital?

There are too many variations in models of care to list them exhaustively. Trained and certified Child Passenger Safety Technicians are the most qualified to provide education, and installation training for families. These individuals have completed 3- to 5-day-long standardized course that includes classroom instruction, hands-on work with car safety seats and vehicles, and participation in a community safety seat checkup event. Many hospitals and health centers have certified CPS Technicians on staff. Anecdotally, however, it is known that individuals without certification are involved in child passenger safety education and assistance to families. There are many sites where car safety seats may be loaned or given away without any education provided. The certified Technicians may be nursing staff (medical assistants, licensed practical nurses, and registered nurses), social work staff, Safe Kids staff, other hospital staff, and rarely
physicians. Some staff members may not be certified with the standardized course, but through a shorter version of the course; others receive no formal training at all. For car safety seat testing prior to discharge of a preterm infant, a coordination of efforts between nursing and CPS Technicians seems to work well.

9. Can child passenger safety be addressed differently in different hospital systems models (e.g., integrated health systems)?

There may be opportunities to incorporate incentives to provide child passenger safety services and to ensure quality through integrated health systems. For example, we know anecdotally of a few pay-for-performances efforts have occurred to my knowledge to incentivize providing outpatient counseling on child passenger safety and ensuring that children are using car safety seats. We were not able to find any compilation of information regarding experiences to date in this area.

10. How many infants and children would be affected if hospitals addressed child passenger safety as part of discharge?

There are slightly more than 4 million births per year in the United States. In 2005, the latest year for which data are available, there were 4,138,349 births in the United States. \(^{31}\) In 2004, 8.1% of newborns were low birth weight (less than 2500 grams or 5 lbs. 8 oz.). \(^{32}\) There is no universally agreed upon safe weight before a child can be discharged. Current practice involves an overall assessment of the newborn’s overall health and issues related to ensuring adequate and appropriate care of the child after discharge. Newborns with birth weights of less than 2500 g at birth may stay longer in the hospital than children who weigh more than 2500 g, but may still be discharged at 2200 g (4 lb. 13 oz.) or even less.

According to the National Hospital Discharge Survey, there were 2,298,000 hospital discharges for children under the age of 15 years (excluding newborns) in the US in 2006. \(^{33}\)

There are 7,569 hospitals in the United States. \(^{34}\)

11. How can hospitals decide which patients a child passenger safety discharge policy should cover? What age patients should be included? Should policies address only children with special health care needs or all children? Should staff coverage be provided at all times, or should services be offered only during certain hours? Can an institution phase in child passenger safety activities or must all children be included at once? What are the implications for equity in provision of care?

Because of the special child passenger safety considerations of children through the time they should be in a belt-positioning booster seat, it can be argued that, to be complete, any hospital discharge policy should cover issues related to children through this age/size. Some attention to children with special health care needs should be a part of a hospital discharge policy given that it is precisely at the time of discharge from the hospital (e.g., following surgery, because of injury or treatment of an injury) that such issues are most likely to arise. The 1999 AAP policy statement “Transporting Children With Special Health Care Needs” addresses the details of
many of these issues. Because most of hospital discharges typically are planned to occur during normal business hours, and because of the financial implications of attempting to provide services after hours, it would be most practical to expect that hospitals first develop the capacity to address the child passenger safety needs at hospital discharge during the usual daytime hours.

12. What special considerations are there for transporting newborns?

Since the mid-1980s, it has been recognized that premature infants require special attention with regards to child passenger safety. Premature infants often are discharged at weights lower than the lower weight limits of standard infant car safety seats. Premature infants also have an increased risk of cardiopulmonary compromise while in a semi-reclined position. Multiple studies have documented that being in a car safety seat in a semi-reclined position confers an increased risk of apnea, bradycardia and oxygen desaturation in children born preterm (<37 week gestational age). The AAP issued a policy statement specific to this issue in 1991 (Safe Transportation of Premature Infants), with a revision published in 1996 (Safe Transportation of Premature and Low Birth Weight Infants). A Clinical Report of the same name will be published by the AAP later in 2009. This Clinical Report will serve as a revision of the policy statement.

According to the 1996 policy statement, the AAP recommends:

- Preterm infants born at < 37 weeks should have a period of observation in a car safety seat before hospital discharge to observe for possible apnea, bradycardia or oxygen desaturation.
- Travel should be minimized for infants at risk
- Infants with documented desaturation, apnea, or bradycardia in a semi-upright position should travel in a supine or prone position in an alternative safety device.
- Infants requiring cardiorespiratory monitoring should use the equipment during travel. Equipment associated with this monitoring should be secured to prevent it from causing injury in a crash.

A recent Cochrane Collaboration review found no randomized controlled trials to provide evidence to answer the question of whether pre-discharge “car seat challenge” or “angle tolerance testing” is beneficial or harmful to preterm infants. The authors of this review called for further studies “to determine whether the car seat challenge accurately predicts the risk of clinically significant adverse events in preterm infants traveling in car seats.”

A Texas study evaluated 151 very low birth weight infants (≤ 1500 g and < 37 weeks gestational age) in car safety seats and in car beds and reported that no evidence was found that an event (apnea > 20 secs, bradycardia < 80 beats per minute for > 5 secs, desaturation <88% for > 10 secs, or absent nasal air flow) was less likely in a car bed compared to a car safety seat. That study concluded that no matter what device is used, very low birth weight infants require observation during travel.

There is significant disagreement regarding what findings on a “car seat challenge” are predictive of significant cardiorespiratory events while in a car seat in travel. This question ties
directly into the most appropriate definition of a “failure” on the car seat challenge. In Pilley and McGuire's 2005 review and 2006 Cochrane review, they refer to AAP guidelines (from 1991, 1996, and 1999) for defining a failure of the car seat challenge for premature infants as apnea >20 secs, bradycardia < 80 beats per minute or oxygen saturation < 90%. However, none of the AAP documents referenced mentions such parameters as defining a failure. The source for these cutoffs is not known. We have emailed the authors to clarify this point but have not received a response to date.

Other questions regarding transportation of newborns require additional research and cannot be answered in an evidence-based manner at this point. These include:

- Is there any relationship between cardiorespiratory events while in a car seat and future SIDS?
- How do findings of a car seat challenge in a hospital correlate with monitoring during travel?
- Is there any benefit in terms of crash protection between infant seats and car beds for preterm infants?
- Is there any issue of head inserts or other aftermarket products, and infant overheating and SIDS?
- What is the appropriate means of evaluating a child to graduate from a car bed to an infant seat?
- If infants have similar rates of cardiopulmonary events in a car bed and an infant car seat, are they ready for discharge?
- What is the current range of practice in US hospitals regarding car seat challenge or angle tolerance testing for preterm or low birth weight infants?
- What are the implications for increasing length of stay, hospital charges, reimbursement from Medicaid or private insurance if a child fails the car seat challenge?
- Who should perform the car seat challenge? Can this be done safely and correctly without the assistance of a certified CPS technician?
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