Child Restraint Systems and Airline Travel

Preparing to travel with your child on an airliner can involve decision making that can be fraught with practical and economic decisions, with safety considerations complicating matters. Deciding when and how to use child safety restraints aboard the airliner can be daunting, particularly when already considering using an existing automotive safety seat. This brochure provides basic information to assist in deciding on an appropriate child restraint system. For more detailed information, please visit the Aerospace Medical Association website at http://www.asma.org/publications/medical-publications-for-airline-travel.

The Federal Aviation Agency (FAA), which regulates aviation within the United States, allows children less than two years of age to sit in the lap of an adult while traveling on an airliner, but after two years of age children are required to have their own seat. This leaves the parent of a child less than two years old with some difficult decisions:

- Should I purchase a seat for my under two year old child?
- If I do, is my child really safer in an adult seat?
- Can I afford the additional cost?

Additionally, for a child of any age, parents must decide on:

- How to restrain the child in an adult sized seat?
- When should a child be considered big enough to safely use an adult restraint?

Why? Restraint systems on aircraft are intended to serve two basic purposes:

- Prevention of occupant ejection from his/her seat during turbulence and
- Restraint of the occupant during a crash.

Clearly, the first purpose is required far more often than the latter, but both functions have been shown by the National Transportation Safety Board (NTSB) to be important for occupant safety during travel in commercial aircraft.

The lap held child: If you are still leaning toward traveling with an unrestrained child, you should be aware that although the FAA allows children under two years old to travel in the lap of an adult, they do not recommend this practice. Additionally, every governmental and safety organization that we know advises against this practice, including the NTSB, the American Academy of Pediatrics (AAP), and the Centers for Disease Control (CDC).

In an emergency:

- If you are traveling with an unrestrained child, during heavy turbulence, an emergency landing or anticipated crash, you should provide as uniform support as possible to the infant's head, neck, and body, and lean over the infant to minimize the possibility of injury due to flailing. Flailing injuries occur due to contact of a part of the body (e.g. limbs) with interior structures due to inadequate restraint (flailing).
- Children which are occupying approved child restraint devices should be braced in accordance with the manufacturer's instructions.
- Children in passenger seats should utilize the same brace position as adults.

Airliner vs. Automobile Safety: The technical issues in restraining a child in an airplane are actually quite similar to those encountered in restraining a child in an automobile. Since a child is no different in an airplane than in a car, the basic principles of restraint apply equally to both situations. Consequently, an appropriate restraint used in an automobile is also generally appropriate in an airplane with one major caveat: ***it must be approved for use on airplanes by the FAA.*** Any automobile "Child Restraint Systems" (CRS) certified for use on aircraft may be allowed to be used in airplanes, with the exception of boosters and harness restraints even if they are labeled for aircraft use. The discrepancy in recommendations between cars and airplanes exists because automobiles are equipped with 3-point restraint systems, which include both a lap belt and a shoulder belt while airliner seat only have a lap belt.

Figure 1. Example of an FAA approved combination seat

Figure 2. Example of an ACSD

Combination Seats: CRSs that can be used forward-facing with an internal harness or as a booster seat are referred to as "combination seats." They are designed to accommodate the vehicle's 3-point restraint system to secure the child and the seat, or they can be secured to the vehicle seat with the vehicle's lap belt while the child utilizes the internal harness. ***Figure 1*** is an example of an approved combination seat. Typically, combination seats can be used in aircraft when their internal harness is used.

For Aircraft Only: The FAA has also approved a class of restraint systems not approved by NHTSA, but that meet the requirements of FAA exclusively for use on board aircraft. The FAA refers to these seats as "Aviation Child Safety Devices" (ACSD) and the FAA regulations regarding the use of CRSs on board aircraft also apply to the use of ACSDs. As an example, ***Figure 2*** shows an ACSD recently approved by the FAA for use on board aircraft for children weighing between 22 and 44 pounds (10-20 kg) that is not certified by NHTSA for automobile use.

Bottom line: If you intend to use a CRS on board an aircraft, it is best to ensure the required label stating, ***"this restraint is certified for use in motor***

vehicles and aircraft" or similar wording is prominent and clearly readable or you may be asked to check the CRS as baggage (AirSafe.com). If your CRS has an unreadable label, the FAA requires that a letter from the manufacturer that "specifically ties the CRS (through a detailed description or specific make and model number) to approval for use on aircraft" be provided to airline personnel. An owner's manual is also acceptable as proof of safety standards.

International: CRSs approved by foreign governments or the UN are also allowed if they have a solid back and seat, have internal restraint straps, and a label showing approval for aviation use.

Consider phases of your trip: Parents likely own a CRS for use in the family automobile and since they may need a CRS when they arrive at their destination, consideration should be given to using that CRS on board the airplane as long as it is appropriately certified and labeled. Airlines may provide CRSs for use aboard their aircraft. Check with your airline before your departure date and, if your trip involves multiple legs, ensure a CRS is available for all legs of your trip. Only one airline (Virgin Atlantic) provides this service currently.

Recommendations:

- The American Academy of Pediatrics (AAP) and the FAA recommend all children use an approved CRS appropriate for their age, height and weight when traveling on an airplane until the child weighs more than 40 lbs (18 kg). Above this weight they consider a child can safely use the aircraft seat belt.
- Although many authorities believe children over 40 pounds (18 kg) are adequately restrained by the adult lap belt in airline seats, some approved CRSs may be used by children over 40 pounds. CRS manufacturers have very recently started offering forward-facing, convertible CRSs that are certified for use in automobiles and aircraft for children up to 80 pounds (36 kg).
- Some combination seats with backs and internal harnesses may be used by children weighing between 40 and 80 pounds (18-36 kg). CRSs have the advantage of providing upper torso restraint to a child occupant, providing them a level of protection above that offered by a lap belt only, primarily by preventing upper torso flailing during a crash or heavy turbulance. The ACSD shown in **Figure 2** and similar approved systems also provides upper torso restraint, but is only for children up to 44 lbs (20 kg).

Size Considerations: Many organizations and experts offer guidelines for choosing the appropriate seat for your child. These guidelines are briefly summarized in **Table 1**. Some CRSs are too wide to fit in some airline seats, particularly CRSs designed to accommodate childeren up to 80 lbs. The FAA advises that any seat with a width of 16 inches or less should fit in any airline seat. If your seat is wider than 16 inches (40.6 cm), you can check with the airline to find out the width of the seats on the aircraft.

Infants and Small Children: AAP and CDC agree that infants may safely fly in airplanes and they recommend that infants be secured in approved rear-facing CRSs until they are at least one year old and at least 20 pounds (9 kg). Children older than one year old and between 20 and 40 pounds (9-18 kg) may be secured in an approved forward-facing CRS.

Table 1
Guidelines for CRS Use on Airliners

Age Group	Limitations	Type of Seat	Guidelines for Aircraft Use
Infants	Less than 1 year old Less than 20 lbs	• Infant seats • Rear facing convertible seats	• Infants should always ride rear-facing until they are at least over 1yr and 20 lbs. • It is advisable for infants to ride rear facing for as long as possible as long as they meet the requirements of their CRS • Rear-facing seats for infants over 20 lbs may be purchased
Toddlers	Over 1 year old Less than 40 lbs	• Rear facing convertible seats • Forward-facing convertible seats. ACSD are also an option for this group.	• When children grow out of their rear-facing seat, they should transition to a forward-facing convertible seat • After 40 lbs children may continue to use a convertible seat until they reach the weight limit of the seat • Some convertible seats accommodate children up to 80 lbs
School-Age	Over 40 lbs Less than 80 lbs	• Lap belt • Convertible seat • Combination seat with an internal harness	• Children over 40 lbs may use the adult lap belt in their airline seat • They may also use an approved combination seat or continue in a convertible seat until they exceed the weight limits for that seat
Older Children	Taller than 4'9" Over 80 lbs	• Lap belt	• Children above this height and weight are considered adult size and should use the lap belt in their airline seat