



## INFANT CAR SEAT TOLERANCE SCREENING GUIDELINES

**Key Words:** Car Seat Tolerance Screen (CSTS), Car Seat Test, Infant Car Seat Challenge

### I.

#### A. OBJECTIVE:

To provide guidelines for the evaluation of infants at risk for apnea, bradycardia, and arterial oxygen desaturations while in a semi-upright car seat in order to promote safe transport in a motor vehicle.

#### B. INDICATIONS FOR USE:

The American Academy of Pediatrics (AAP) recommends at-risk infants should undergo a period of observation in a car seat or car bed before hospital discharge, known as the Car Seat Tolerance Screen (formerly Car Seat Test or Car Seat Challenge) in order to monitor for possible apnea, bradycardia, or arterial oxygen desaturation.

1. Infants at-risk for apnea, bradycardia, desaturations at University of Maryland Medical Center:
  - a) Infants born <37 weeks gestational age.
  - b) Infants with Birth Weight <2500 grams (5lbs 8oz).
  - c) Infants with medical conditions that place them at risk, including but not limited to those with hypotonia, airway anomalies, cyanotic congenital heart disease.

#### C. DEFINITIONS:

1. Blanket roll: Rolled blanket or wash cloth used to stabilize the infant in the car seat. Can be placed on both sides of the head and trunk to improve lateral support for head and trunk. Can not be placed under infant or between infant and harness restraint.
2. Car Bed: A type of child restraint system for infants who must lie prone, side-lying, or supine.
3. Car Seat: A crash tested device designed to provide an infant/child crash protection in a motor vehicle.
4. Certified Child Passenger Safety Technician: (CPST) Individual who has successfully completed the National Highway Traffic Safety Administration (NHTSA) certification course for car seat safety & maintains current certification status.
5. Convertible Car Seat: A car seat that “converts” from semi-upright rear-facing to forward-facing as the child grows beyond the rear-facing age and weight limits.
6. Crotch Roll: Rolled wash cloth placed between infant’s legs and the crotch strap to fill extra space and prevent slouching towards the crotch strap.
7. Harness clip (chest clip): Plastic device that holds the two shoulder straps together over the child’s chest at armpit level. Intended to keep harness straps in position on the shoulders.
8. Harness strap: Car seat straps that restrain the child within the car seat.
9. Head Support Systems: additional padding devices that either come standard with a car safety seat, may be purchased from the manufacturer for a specific car seat, or are sold separately after market to be used nonspecifically with car seats.
10. National Highway Traffic Safety Administration (NHTSA): Federal agency that sets performance requirements for motor vehicles and equipment such as car seats.
11. Recline Angle: angle at which the car seat should be recline per the manufacturer guidelines.



**INFANT CAR SEAT TOLERANCE SCREENING GUIDELINES**

**II. RESPONSIBILITY**

A. All nursing, nurse practitioner, and physician staff are responsible for implementing this policy

<b>Provider responsibility</b>	<ul style="list-style-type: none"> <li>• Identify eligible neonates.</li> <li>• Discuss reasons for testing, procedure, and potential outcomes with family, provide handout describing the car seat tolerance screen.</li> <li>• Enter order for car seat tolerance screen.</li> <li>• Review result of car seat tolerance screen with RN and family.</li> </ul>
<b>RN responsibility</b>	<ul style="list-style-type: none"> <li>• Review car seat tolerance screen procedures with family.</li> <li>• Refer to Car Seat Testing screen in EPIC under Infant Screens</li> <li>• Evaluate car seat appropriateness (within weight limits, all parts intact, recline angle).</li> <li>• Perform car seat tolerance screen per guidelines.</li> <li>• Inform provider of result of test and document reason for failure on documentation tool if appropriate.</li> </ul>
<b>Nurse designated healthcare provider</b>	<ul style="list-style-type: none"> <li>• Directly observe the infant undergoing car seat tolerance screen for the duration of the test if RN unable to remain at bedside.</li> <li>• Alert the RN if any alarms sound or if there is a change in the infant's vital signs or the infant seems distressed.</li> </ul>

**III. PROCEDURE**

A. Purpose:

To promote the safe transportation of infants at risk of apnea, bradycardia, and arterial oxygen desaturation while in the semi-upright car seat position.

B. Indication: Infants at risk for apnea, bradycardia, desaturations

1. Infants born <37 weeks gestational age.
2. Infants with Birth Weight <2500 grams (5lbs 8oz).
3. Infants with medical conditions that place them at risk, including but not limited to:
  - a) Hypotonia (ie neuromuscular disorders, Down Syndrome, HIE)
  - b) Airway anomalies (ie Pierre Robin Sequence, micrognathia)
  - c) Cyanotic congenital heart disease

C. Equipment/supplies needed

1. Car Seat – recommended guidelines for parent's choice of car seat include:
  - a. Infant meets minimum weight limit for car seat.
  - b. Car seat should not have been in any motor vehicle accidents.
  - c. Car seat should be registered for recall notification by parent ([www.safercar.gov](http://www.safercar.gov) or [car seat manufacturer](#)).
  - d. Car seat should have 5-point restraint (without tray or shield).
  - e. Check for all necessary parts (restraint, retainer clip, buckle, etc.).
  - f. Refer to label on car seat shell for model # and date of manufacture
  - g. For any questions/concerns about the use of the parent provided car seat consult a certified CPS technician in unit or the CPS Program coordinator at 8-7532/ page #7163



## INFANT CAR SEAT TOLERANCE SCREENING GUIDELINES

2. Cardio-respiratory monitor with pulse oximetry.
3. Blanket roll and washcloths if needed to optimize positioning.
4. Car Seat Testing screen under infant screens in EPIC.

### D. Car seat tolerance screen guidelines:

#### 1. Assess fit in car seat

- a. Shoulder harness straps through slots even with or below infants shoulders.
- b. Distance of <5.5 inches from crotch strap to seat back.
- c. Harness clip at armpit level, midpoint of infant's chest, not on abdomen or in front of the neck.
- d. Harness straps snug and flat, should not be able to pinch any webbing at collarbone.
- e. Infant should not slouch and buttocks should be flat against the back of the car seat.
- f. Nothing may be added beneath the infant or beneath the harness straps unless provided or approved by the car seat manufacturer.
- g. The infant should not be swaddled when placed in the car seat. The infant's legs should be extended on either side of the crotch buckle strap.
- h. **Head Support Systems:** some car seats are supplied with head-support systems .

i. Only products that come with the car seat by the manufacturer for use with the specific car seat can be used to contribute to stabilizing the infant.

ii. If the manufacturer supplied Head Support System interferes with or prevents the proper head positioning of infant in the car seat, check the instructions to determine if the Head Support System may be removed and blanket rolls or washcloth added for lateral support.

ii. After-market Head Support Systems not supplied by the car seat manufacturer should NOT be used. These may introduce slack into the harness straps, decreasing the safety provided by the car and harness system.

#### i. **Blanket rolls:**

- i. When positioning in a car seat, blanket rolls may be placed on one or both sides of the infant to provide lateral support for the head and trunk.
- ii. Blanket rolls or rolled washcloth may also be placed between infant's legs and behind crotch strap (crotch roll) to prevent extra space and protect from slouching.
- iii. Blanket rolls or rolled washcloths should never be placed behind the infant, between the infant's back and the car seat, or around the top of the infant's head.

j. **Reclining Angle:** rear-facing seats should be reclined as directed by the manufacturer (many require a 45 degree angle recline – always refer to car seat instructions for the required recline angle ). Car seats have an angle indicator that helps with positioning the seat to the correct recline. Blankets



## INFANT CAR SEAT TOLERANCE SCREENING GUIDELINES

under the car seat foot area may be used to help achieve the manufacture's recommended angle. Car seat must be at the correct recline during the testing period.

### 2. **Parent/Guardian Education:**

- a. Parent should be informed to bring car seat in as soon as possible to allow adequate time to assess appropriateness of the seat for the infant.
- b. Parents must view video "Special Delivery: Safe Travel of Premature and Small Infants" available on demand TIGR system #237.
- c. Parents should receive copy of Safe Ride News "Car Safety for Tiny Babies."
- d. (from hospital intranet )
- e. Parents should receive copy of "Information for Parents: The Car Seat Tolerance Screen." (from EPIC car seat screen section or hospital intranet ).
- f. Parents should be counseled to minimize the duration of time the infant spends in the semi-upright position, including in car seat, swings, bouncy chairs, infant carriers regardless of car seat tolerance screen result. Parents should be advised that car seats should be used only for travel.
- g. If the car seat does not meet the above standards, parents should be informed and recommendations given to obtain a car seat that does meet these standards. If the family declines and decides to proceed with their car seat, they must sign the "Discharge With A Non-Recommended Car Seat" Release Form (on hospital intranet ) which should be placed in the medical record.

### 3. **Car Seat Tolerance Screen (CSTS):**

- a. Observation period in car safety seat should be performed 30 minutes to one hour after feeding ideally.
- b. Car seat tolerance screen should be performed within 12-24 hours of anticipated discharge, ideally after 24 hours of life.
- c. Place infant properly into car seat, using blanket rolls as appropriate to ensure proper fit. Remove head support system if it was purchased aftermarket or if it is not appropriate size or does not contribute to stabilizing the infant, as permitted by the manufacturer.
- d. Document what supports were used during the test to ensure proper positioning.
- e. Place pulse oximetry probe onto the infant and monitor for good wave form.
- f. Place on cardio-respiratory monitor using at least 3 leads
- g. Set alarm limits for heart rate 80-200, for saturation 90-100%, & for apnea of 20 sec
- h. Document starting time of the test.
- i. Observation period is at least 90 minutes or estimated travel time to home, whichever is longer.
- j. Infant should be **DIRECTLY** observed for the entire duration of the testing period.
- k. After the 90 minutes, remove the infant from the car seat and resume routine care.



## INFANT CAR SEAT TOLERANCE SCREENING GUIDELINES

4. **Failure criteria:** Document on the Car Safety Seat Monitoring Documentation Tool/ Car Seat Tolerance Screen in electronic record.
  - a. Apnea – pause in breathing for >20 seconds.
  - b. Bradycardia – Heart rate <80 beats per minute lasting >10 seconds.
  - c. Desaturation –
    - i. For infants without cyanotic heart disease: Saturation (SpO<sub>2</sub>) <90% lasting > 10 seconds.
    - i. For infants with Cyanotic Heart Disease: A drop in saturation (SpO<sub>2</sub>) >=10% from the infant's baseline SpO<sub>2</sub> for >10 seconds. (For example, if the baseline saturation is 80%, a drop to 70% for >10 seconds would constitute a failed test.).
  - d. Any alterations in vital signs that are considered concerning to the RN in consultation with the physician or nurse practitioner.
  - e. If none of the above occur, the infant passed the car seat tolerance screen and may go home in the car seat.
  
5. **Failed Car Seat Tolerance Screen**
  - a. If infant meets failure criteria, perform appropriate interventions, ie repositioning, stimulation, removal from car seat, oxygen administration. Communicate failed car seat tolerance screen result and reason for failure with ordering physician and/or practitioner as soon as possible.
  - b. If infant was found to be malpositioned and improperly restrained in the car seat, reposition appropriately and restart the test with provider approval.
  - c. If infant was properly positioned and fails:
    - i. Inform provider of result.
    - ii. Provider/Practitioner to inform family of result.
    - iii. Thorough medical evaluation in order to screen for causes of illness, consider further medical work up as indicated.
    - iv. May repeat car seat tolerance screen 12-24 hours after failed test.
    - v. If infant passes subsequent test while properly positioned, may be discharged home in car seat.
  - d. **If infant fails multiple car seat tolerance screens:**
    - i. Inform medical provider and family.
    - ii. Consider further medical evaluation as indicated, consider NICU, Pulmonology and/or Cardiology consultation.
    - iii. If an infant has failed two or more CSTS in his/her car seat, but is otherwise healthy and approved for discharge, retest for at least 90 minutes, or duration of the car ride home, in a supine car bed. Consult a hospital certified Child Passenger Safety Technician or the hospital Child Passenger Safety Program (8-7532)/Pager #7163 for obtaining a car bed (see Special Needs Car Seat Program Guidelines).
    - iv. If passes car bed testing, may discharge in car bed. Recommend travel in car bed until passes repeat car seat tolerance screening.
    - v. Recommend repeat car seat tolerance screen after 2-4 weeks or once corrected to 44 weeks post-menstrual age.



## INFANT CAR SEAT TOLERANCE SCREENING GUIDELINES

### IV. REPORTABLE CONDITIONS

If the car seat does not meet the above standards, parents should be informed and recommendation given to obtain a car seat that does meet these standards. If the family declines and decides to proceed with their car seat, they must sign the "Discharge with a Non-Recommended Car Seat" Release Form which should be placed in the medical record.

### V. DOCUMENTATION: Car Seat Testing Screen in electronic record

- A. Indication for testing
- B. Car Seat Manufacturer and Model
- C. Date of manufacture
- D. Appropriateness of car seat for infant's weight
- E. Car Seat Position/Reclining angle
- F. Duration of study (start and end times)
- G. Failure criteria and description of the event
- H. Pass vs. Failed car seat tolerance screen
- I. RN performing test and provider notified

### VI. SUPPORTIVE INFORMATION

#### A. References

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Developers: NL Davis, MD, MMSc

K Hardingham, RN, CPST

2014-2016 Hospital Child Passenger Safety Team

Consultants: S Ogaitis-Jones, CPST-I / MIEMSS Hospital CPS Program

C Myer, CPST-I / MD Kids in Safety Seats

T Whitman, CPST-I/MD Kids in Safety Seats

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