

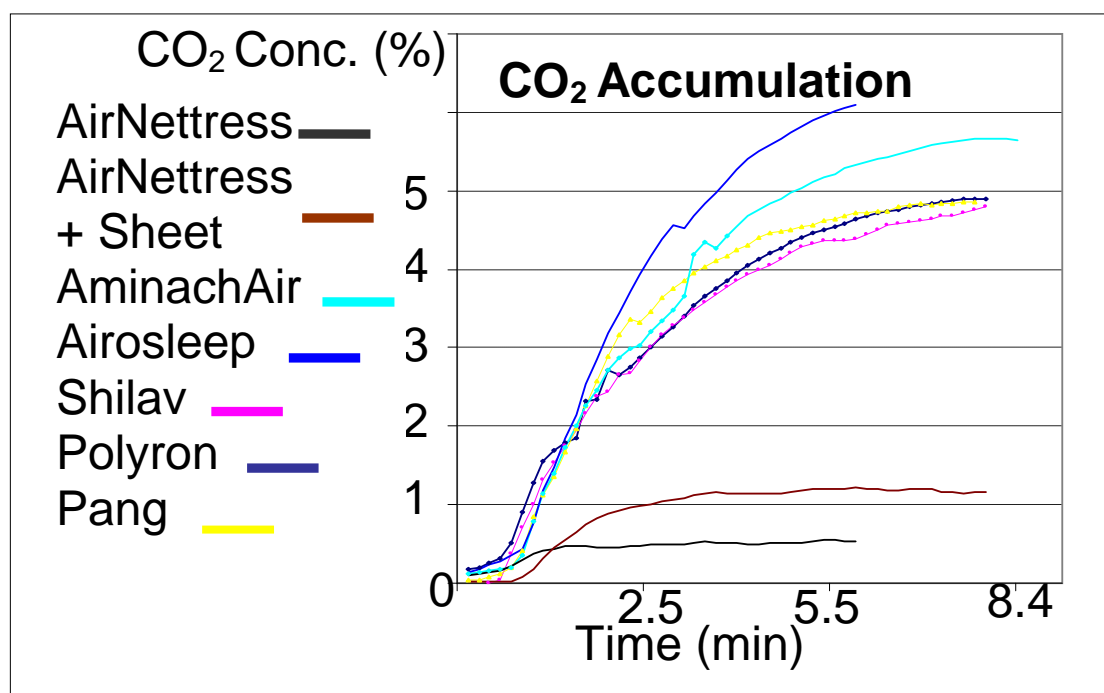
## AirNettress™ – Medical Aspects

AirNettress is made of unique, permeable netting surrounding a wood or aluminum frame. The netting allows for comfort, strength and durability combined with free air and temperature flow through it. These special characteristics enable the mattress to reduce significant risk factors for sudden infant death syndrome (SIDS) and help deal with other significant medical problems that arise during early infancy and childhood.

**Free air flow** – The **increased risk of SIDS** in at-risk infants (prone sleep position, covered by a blanket during sleep or placed on soft bedding) may be explained by **rebreathing of exhaled CO<sub>2</sub>** which is confined to a small unventilated area near a sleeping infant's airway. The porous netting allows for free airflow.

Two studies were performed:

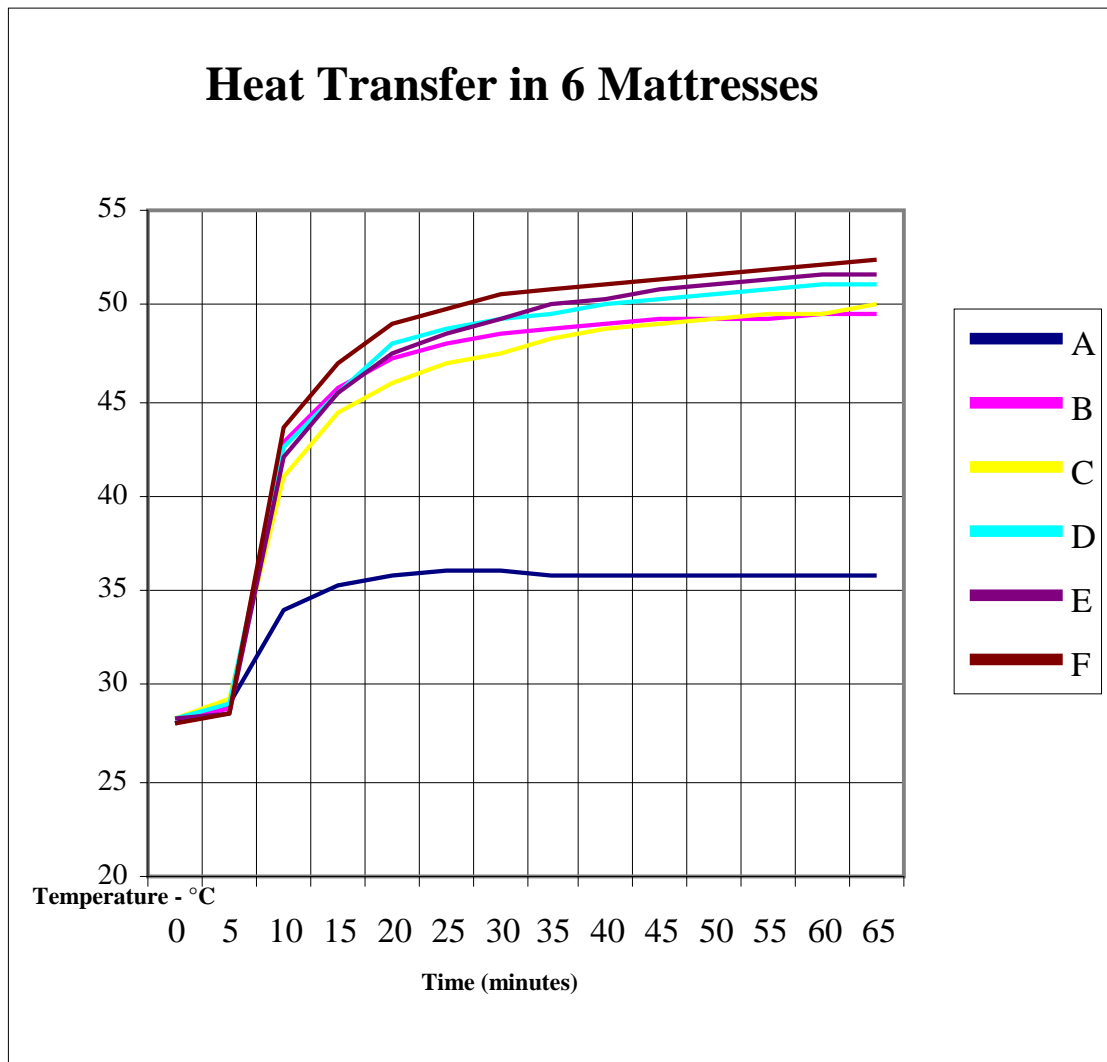
1. In a study performed on a model of a breathing infant, at the Pulmonary Laboratory, Hadassah Medical Center, Jerusalem, Israel AirNettress was found to have a fast rate of CO<sub>2</sub> elimination, the ability to clear away any CO<sub>2</sub> accumulation and an insignificant resistance to air flow.
2. In a similar study performed at the Pulmonary Laboratory, Sheba Medical Center, Tel Hashomer, Israel, CO<sub>2</sub> elimination and the ability to prevent CO<sub>2</sub> accumulation were compared between AirNettress, one standard infant mattress (Pang) and four mattresses (AminachAir, AiroSleep, Shilav and Polyron) that were marketed as able to reduce risk factor for SIDS. CO<sub>2</sub> elimination was considerably faster and the ability to prevent CO<sub>2</sub> accumulation, significantly better than all other mattresses that were tested.



3. A study was performed at the Lev Institute, Jerusalem whose purpose was to measure CO<sub>2</sub> accumulation in a mechanical model of a breathing infant in AirNettress® compared to three infant mattress, which are marketed to prevent prone rebreathing and to one standard infant mattress. The results showed that AirNettress® demonstrated the lowest levels of CO<sub>2</sub> accumulation with and without a netted sheet in comparison to all the other mattresses tested. Only in AirNettress were the levels (with the netted sheet) below the 1.2% limit which is considered a safe environment, according to the National Institution for Occupational Safety and Health (NIOSH), USA.

**Clinical significance:** This quality, which was found only in AirNettress is important for infants during their first months of life and mainly in situations when breathing is possible only through the mattress as in prone sleep or when the face is covered by a blanket or pillow. The fast rate of CO<sub>2</sub> elimination the prevention of CO<sub>2</sub> accumulation in a model of a breathing infant combined with minimal resistance to air flow may prevent the occurrence of a significant risk factor for SIDS.

**Temperature balance - Thermal stress** has been indentified as a significant **risk factor for SIDS** in many studies. The low thermal resistance of the netting allows for ideal temperature balance and prevents overheating and sweating. In a study designed to evaluate the thermal resistance of six infant mattresses: one standard and five that have been recently marketed to reduce risk factors for SIDS, AirNettress (A) was found to have significantly lower resistance than the other mattresses (B-F).

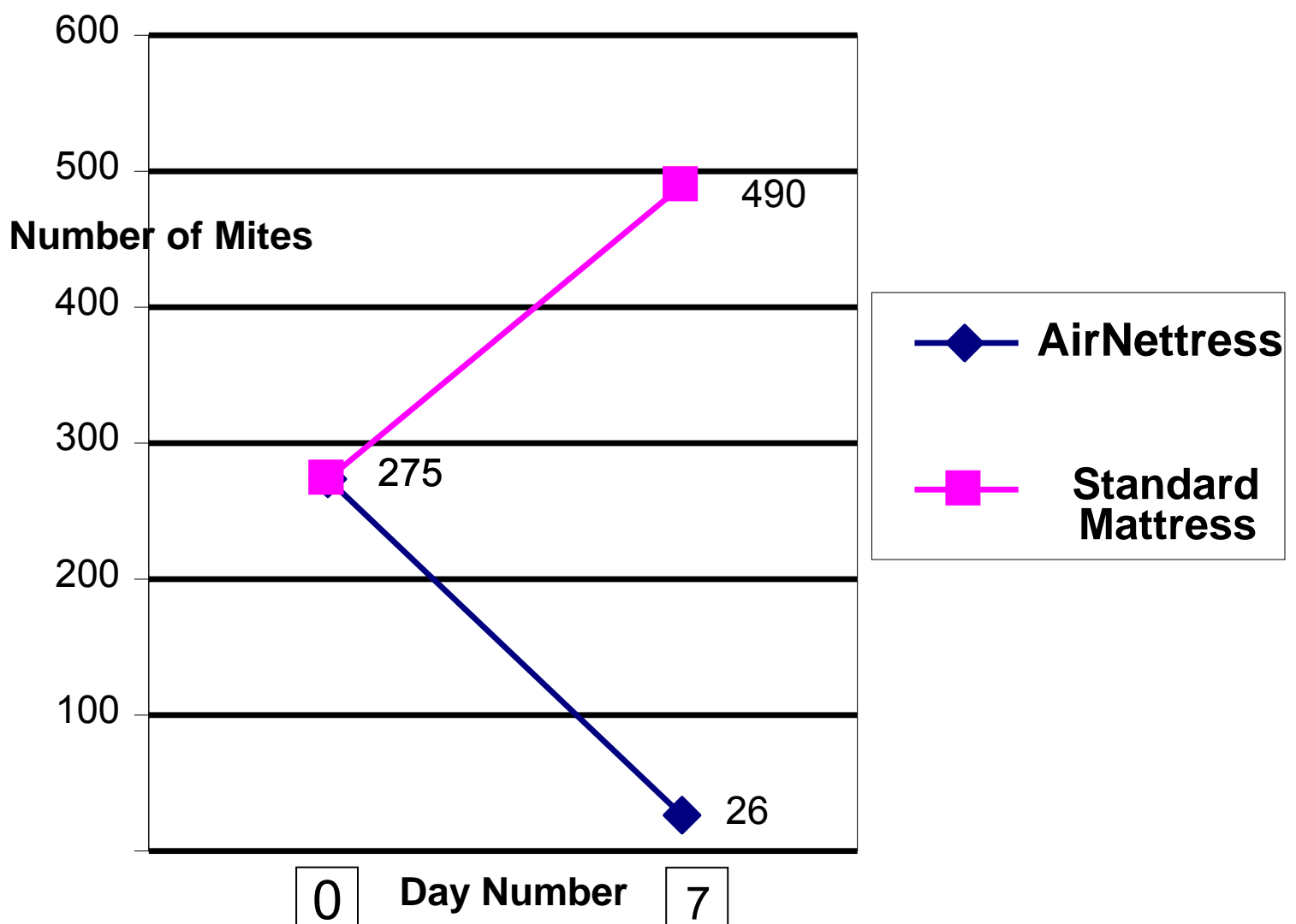


**Clinical significance:** Overheating and hyperthermia are considered risk factors in the etiology of SIDS. Infants lose much of their heat through the head and face, particularly when the rest of the body is covered. Use of the new mattress enables rapid temperature equilibration and prevents overheating, therefore reducing the occurrence of another significant risk factor for SIDS.

**Decreased exposure to house dust mites** - House dust mites (HDM) are arthropods whose optimal growth requires high humidity, moderate temperature (21-27°C) and an adequate food source, mainly human skin scales. The largest numbers of mites are usually found in dust samples taken from uncovered mattress surfaces, bedding, upholstered furniture and floor carpeting. The correlation between dust mite exposure, **development** of allergic disease such as asthma and allergic rhinitis and **exacerbation** of disease have been documented in many studies

In a study performed by Dr Costa Mumcuglu, Parasitology Laboratory, Hadassah Hospital Medical School, Jerusalem, Israel, HDM survival on the new surface was compared to survival on standard mattresses. HDM could not survive on the experimental sleep surface whereas the mites not only survived but reproduced and proliferated on the standard mattresses.

### **Days 0 and 7: Average number of mites**



**Clinical significance:** Sleeping on the new mattress significantly decreases exposure to HDM and may decrease the development of allergic diseases such as asthma, allergic rhinitis and atopic dermatitis and reduce exacerbation of existing diseases.

**Promotes infant muscular development** - Motor development is seen to depend upon various factors that may reside in the infant or in the environment. Since the observation in 1992 that sudden infant death syndrome (SID) may be associated with infants sleeping in prone, parents have been urged to put their infants on their back while sleeping. Some researchers expressed concerns that the supine sleeping position seemed to delay the motor development of the infants. The taut, porous surface of the new mattress enables infants to be placed face down for long periods of time. In addition, local sagging of conventional mattresses creating "mattress memory", which may also hinder infant development, does not occur on the new mattress.

**Clinical significance:** The ability to place infants on AirNettress in the prone position for longer periods of time may promote infant development in healthy term, low-risk preterm and very-low-weight preterm infants. The taut sleep surface of AirNettress with lack of mattress flaccidity or "memory" provides an ideal developmental, orthopedic surface for infants.

**Decreases regurgitation and increases clearance from the respiratory passages** – The mattress can be elevated so that the infants head and trunk are raised.

**Clinical significance:** Changing the mattress angle allows the baby's head to be raised thus reducing regurgitation and improving the clearance of mucus from the respiratory passages.

**Free flow of fluids through the mattress** - All liquids including water, regurgitated food, vomit or urine seep through the mattress.

**Clinical significance:** Throughout toilet training urine seeps through the porous netting and the sleeping surface remains completely dry. Prolonged contact of urine with the infant's sensitive skin is avoided therefore preventing skin irritation. In infants with gastro esophageal reflux (spitting up) or during periods of respiratory diseases regurgitated food and mucus seep through the sleep surface hence preventing secondary aspiration.

**Cleanliness and sterility** - The strength and porous nature of the mattress surface facilitates constant airflow and enables thorough cleaning and sterilization.

**Clinical significance:** Bacterial infections and the presence of bacterial toxins have been reported for many sudden infant death syndrome cases and a common bacterial toxins hypothesis for SIDS has been proposed. Use of the new netted sleeping

surface could prevent the existence of another risk factor which is associated with SIDS and create a clean sleep environment for the infant.