

NOISE MATTERS

We are all exposed to myriad of different sounds during our day. Some are pleasant, some are less pleasant and some are just noise. The same holds true for preterm infants in the NICU, whose ears are not yet fully developed nor ready for the world outside of their mother's womb.

SOUND CHECK



Sound is vibration transmitted in a medium (typically air with a frequency range between about 20 Hz and 20 kHz)



SPLs have a vast range and therefore are reported on a logarithm scale known as the decibel (dB)



Measurement of sound pressure levels (SPLs), their frequencies and temporal distribution is important in evaluating the level of disturbance

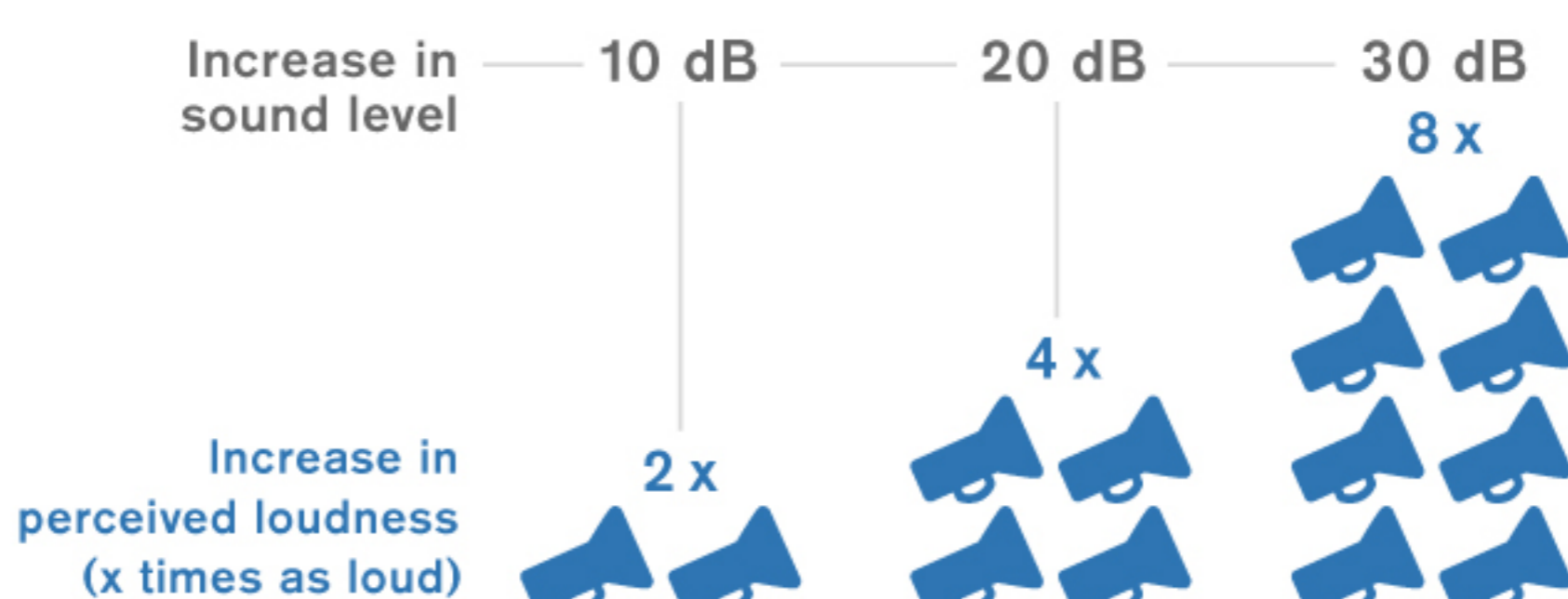


Noise = undesirable sound

MEASURING SOUND

In contrast to other units of measure, such as distance or weight, sound is measured on a logarithmic scale.

An increase in sound levels from 100 to 110 decibels does not represent a 10 percent increase, but rather a doubling of the perceived loudness.



WHAT INFANTS HEAR INSIDE THE INCUBATOR

dB (A)* level	Everyday examples	Inside incubator	Effect
20 dB(A)	Whisper		< 35 Desirable for sleep
60 dB(A)	Normal conversation	Phone ringing	Annoyance
70 dB(A)	Vacuum cleaner	Paper ripping	
80 dB(A)	Heavy traffic	Tapping incubator with fingers	Hearing loss with persistent exposure
90 dB(A)	Pneumatic drill	Monitor alarm	
100 dB(A)	Lawnmower	Putting glass bottle on top of incubator	Pain, distress and risk of immediate hearing loss
120 dB(A)	Loud car stereo	Knocking on incubator	
140 dB(A)	Jet plane 30 m overhead	Dropping basin full of instruments on incubator or floor	

* A-weighting is applied to instrument-measured sound levels in an effort to account for the relative loudness perceived by the human ear, as the ear is less sensitive to low audio frequencies

EFFECTS OF LOUD NOISES ON INFANTS

Evidence has shown that noise in the NICU can negatively affect the cardiovascular, respiratory, auditory and nervous systems of the preterm infant.

Here are some infant responses to loud noise:



tachycardia



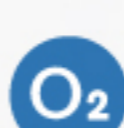
pauses in breathing



peripheral vasoconstriction



bradycardia



oxygen desaturation



weight loss

TAKEAWAY



Preterm neonates, who often spend weeks in the NICU, are especially sensitive to noises because their auditory system is at a critical period of neurodevelopment.

