

# Devices and Methods for Umbilical Cord Processing

**A device for extracting native Wharton's Jelly from the umbilical cord for the repair of newborn cleft lip and cleft palate has been developed in conjunction with processing methods, that, when the resultant materials are included in the alveolar pocket at the time of palate repair, enhances bone growth and accelerates healing, proving to be an adjunct of great potential to orofacial cleft repair.**

## Background

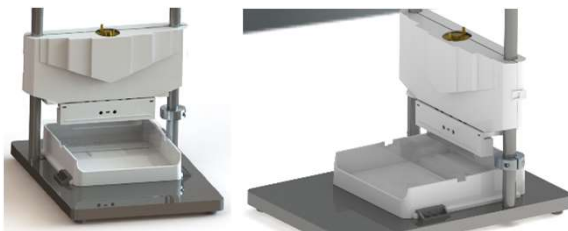
Cleft lip and cleft palate (CLP) is the most common birth defect in the United States, affecting more than 2,650 children born each year according to the Centers for Disease Control and Prevention. The accepted standard treatment for cleft palate is autologous bone grafting, which provides a stable repair but is invasive and can be followed by potential complications of graft exposure and loss. In addition, autologous bone grafting is subject to donor site morbidity including infection, long-term pain and/or nerve damage that lead to the need of additional surgeries. Another strategy based on using biomaterials seeded with bone marrow (BM) stem cells has proven promising, but BM harvest is too invasive to use in CLP repair in newborns.

## Components

Native Wharton's Jelly (nWJ) is the connective tissue of the umbilical cord, and it is composed of a network of proteoglycans and collagen embedded with perinatal stem cells, a bridge between embryonic and adult stem cells without the limitations of either. It is a natural "tissue engineering" construct that provides a scaffold derived from the recipient's own molecules, naturally seeded with the recipient's own stem cells, and is thus immunologically inert. Since nWJ is typically discarded as post-delivery medical waste, its use does not pose ethical concerns and its harvest is completely non-invasive. Researchers at UTHealth have developed a device to extract the nWJ, developed methods to process the nWJ, and have shown in an alveolar defect model representative of cleft palate surgery in the rat, that inclusion of nWJ in the alveolar pocket at the time of palate repair enhances bone growth and accelerates healing, proving to be an adjunct of great potential to orofacial cleft repair.

## Potential Benefits/Technology Advantages

- Enhanced bone growth and accelerated healing in cleft lip/cleft palate repair
- Better anticipation of the timing of surgical correction
- Reduction or elimination of the need for subsequent bone grafting.



## For more information, please contact:

Christine E. Flynn, Ph.D., The Office of Technology Management  
(713) 500-3383 [Christine.Flynn@uth.tmc.edu](mailto:Christine.Flynn@uth.tmc.edu)

## Intellectual Property Status

Patent pending:

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national stage entries of  
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## Stage of Development

Advanced prototype  
developed

## About the Inventors



Charles S. Cox, Jr., M.D. is  
Professor of Pediatric Surgery  
in the McGovern Medical  
School.

Brijesh "Billy" Gill, M.D. is an  
Associate Professor of  
Surgery in the McGovern  
Medical School.