

# **Extracorporeal shock wave therapy and its effects on the nervous system - A critical review of current literature**

## **Author:**

Morgan Mackenzie Wise, Kevin Seals, Michael Chang

## **Institution:**

University of Washington Department of Rehabilitation Medicine 1959 NE Pacific Street Box 356490 Seattle, WA 98195-6490

## **Device and producing company:**

None

## **Introduction:**

Extracorporeal Shock Wave Therapy (ESWT) is a versatile treatment modality used over the past 25 years to disintegrate nephrolithiasis, and has recently been shown to have multiple clinical applications in human musculoskeletal systems. Although initially painful, ESWT evokes a subsequent analgesic response and thus must interact with the nervous system. However, there has been little research into the mechanism, and results are often contradictory.

## **Methods:**

We have compiled an extensive review of the current ESWT-NS research via electronic journal databases in an attempt to better understand how SWs affect the nervous system. Our goal was to analyze the relationship between the contradictory papers and offer explanations, general conclusions and future directions with relation to the individual papers and ESWT-NS interactions as a whole.

## **Results:**

Our review offers an overview of the nervous system as it relates to ESWT, followed by an in-depth analysis of past and current research within the peripheral and central nervous systems. This analysis encompasses neuropeptide release, neuronal morphology, the endogenous opioid system, hyperstimulation analgesia, and the gate control theory.

## **Discussion:**

Ultimately the complexity of the nervous system makes analysis and methodology difficult. As a result, most papers have inconclusive findings and therefore much of ESWT-mediated pain regulation is left to speculation, making a complete understanding of ESWT-induced analgesia difficult.

## **Conclusion:**

The neurochemicals implicated in nociception, the pathways pain travels, and regulation of these pathways must be studied in vivo to further elucidate the mechanism by which this therapeutic treatment modality confers its analgesic effect.