



'ALGORITHM TO QUANTIFY THE ABDOMINAL COMMITMENT IN NEWBORNS'

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INTRODUCTION:

- Necrotizing enterocolitis (NEC) is a neonatal disease occurring mainly in premature infants. Consisting of **intestinal necrosis** involving the colon, the ileum or both.
- It is extremely important that the damage to the intestinal walls are **quantified more precisely**.

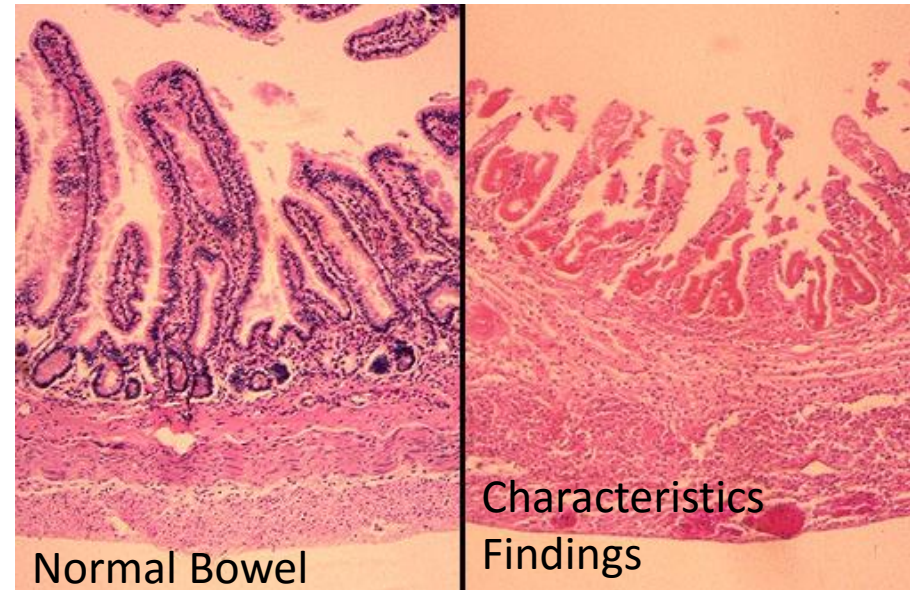
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INTRODUCTION:

- Characteristics findings like **necrosis** beginning in the mucosa and extending to involve the muscular wall, with the **potential for perforation**.



Differences in intestinal mucosa

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INTRODUCTION:

- An **increased incidence** of the disease was observed recently, with the mortality rate among 18% and 45%.
- Currently, it becomes a gastrointestinal emergency most feared and lethal.
- The use of **COMPUTER SYSTEMS** provides a more objective assessment.

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PURPOSE:

- The main purpose is developing a computacional tool using x rays images from pediatric patients to assess the **impairment of bowel loops**, as specific morphological characteristics of damaged walls.

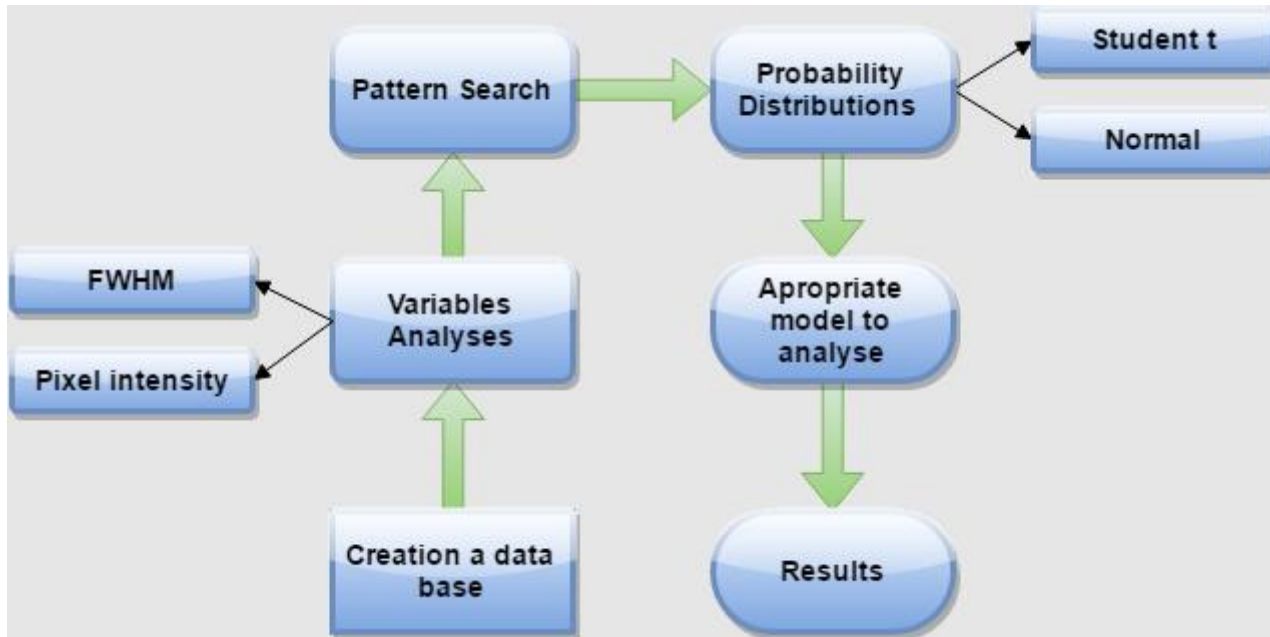
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METHODS:

- 20 x-rays exams, during treatment of 10 patients with NEC confirmed;



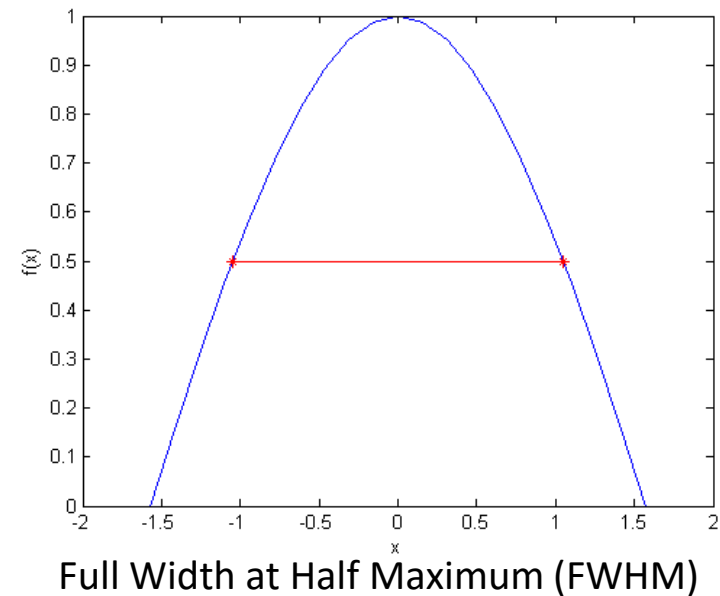
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METHODS:

- Signal strength in the images were calculated from a Gaussian Distribution and were measured **Full Width at Half Maximum (FWHM)** of the band.



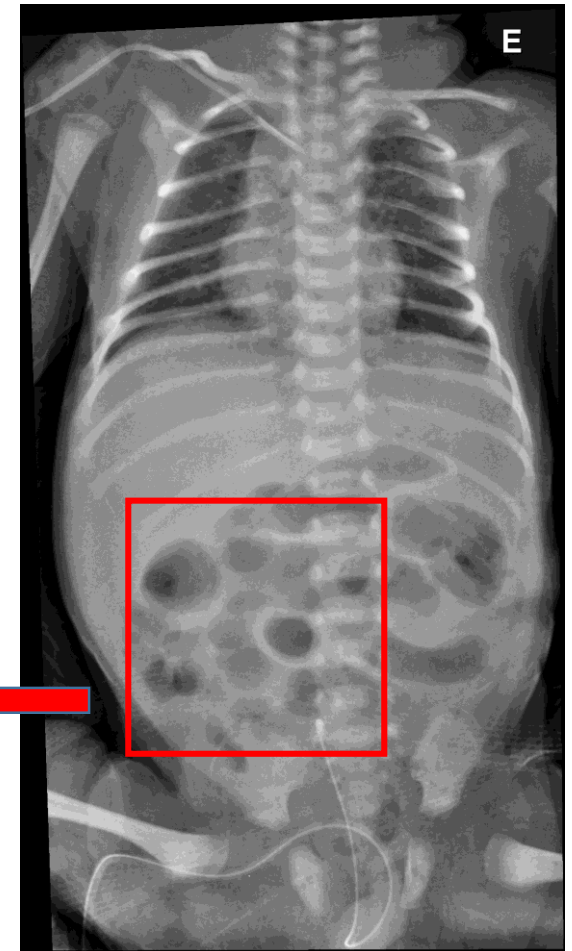
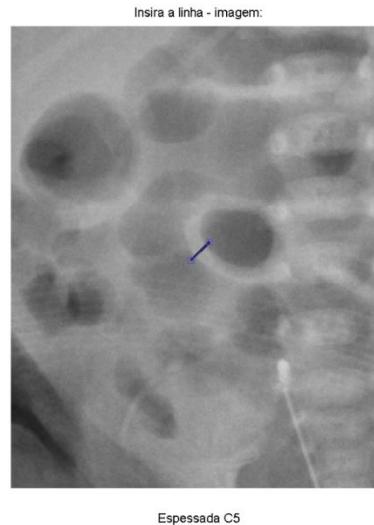
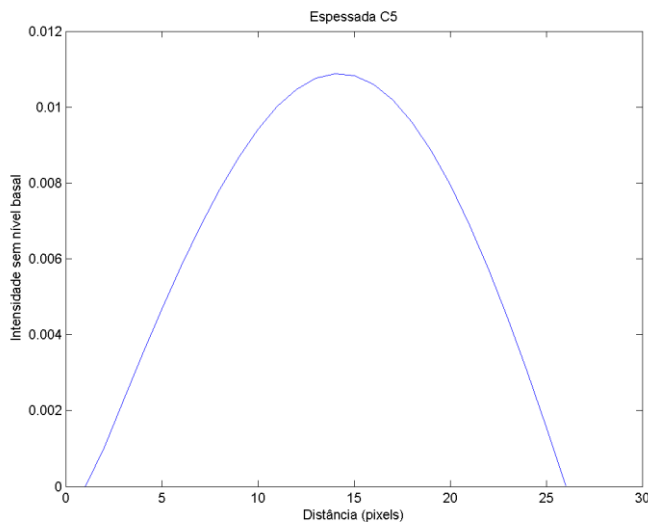
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METHODS:

- From the patient, a section with the disease was chosen to be analyzed.
- A Gaussian was developed to represent the data of the patient's disease.

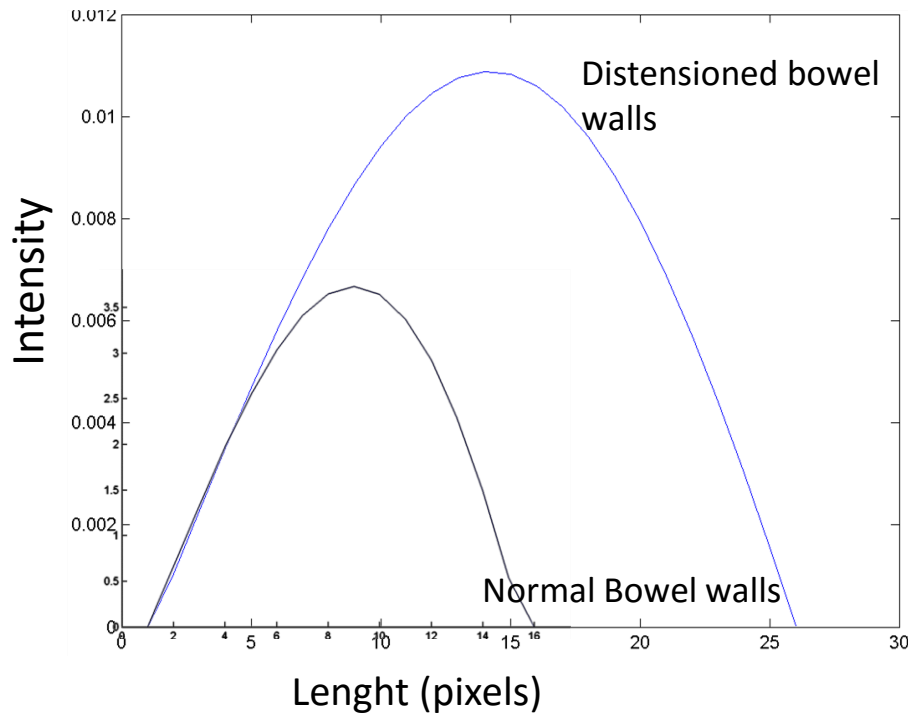


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RESULTS:



- Difference between Gaussian of normal and distensioned bowel walls, which is measured the thickness by the intensity of the pixels.

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CONCLUSIONS:

- The computational algorithm allows the **quantification of the impairment** of the walls of the bowel affected by NEC.
- Quantification aided by computer systems is of great importance for reliable assessment of bowel loops involvement, assisting radiologists in the diagnosis.