

IDSS PW2

A decision support system for predicting the treatment of ectopic pregnancies

De Ramon Fernandez, A., Ruiz Fernandez,D., and Prieto Sanchez, M. T. (2019). A decision support system for predicting the treatment of ectopic pregnancies. *International Journal of Medical Informatics*, 129 (November 2018):198–204.



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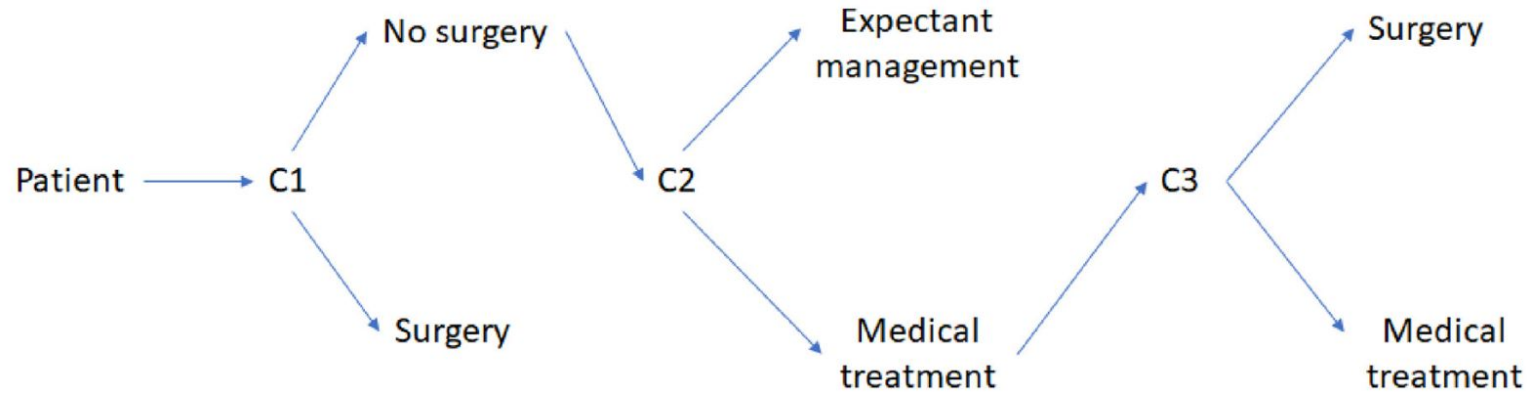
Overview

- Strategy to choose in case of ectopic pregnancy (fetus is developing outside the womb)
- 3 possible actions
 - Expectant management
 - Medical treatment
 - Surgery
- Still a challenge to choose the right treatment
- Goal: reducing morbidity and mortality
- Medical records of affected patients as training data
- 2 kinds of classifiers
 - 1 stage
 - 3 stage

Model

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Methods

- Different kind of classifier models
 - Multilayer Perceptron
 - Neural Network
 - Support Vector Machine
 - Naive Bayes Classifier
- Optimizations
 - MLP: genetic algorithm + gradient descent
 - Neural network: backpropagation
 - SVM: multiclass learning
- End user
 - Could follow a certain decision from the system with a certain chance on succeeding
 - 3 stage classifier has to be followed in different phases of treatment

Validation

- Validation techniques
 - 10 fold cross-validation
 - Confusion matrix
- Best results
 - 1 stage classifier with SVM: 89,7% accuracy
 - 3 stage classifier with SVM: 96,1% accuracy
- Compare if 3-stage is more accurate then 1-stage
- Can 3-stage be used to improve 1-stage classifier