L5/Iliac ATEs

data\_ %>%   
 .[followup\_2y ==TRUE] %>%   
 .[Study=='Op'] %>%   
 .[Site != 'ANK Op'] %>%   
 .[Age < 100] %>%   
 .[`Vital status` == 'Alive'] %>%   
 .[`Posterior Instrumented Fusion` == 'Yes'] %>%   
 .[`Number of Posterior Instrumented Levels` > 3] ->  
 data\_

Initial Patients: 805

data\_ %<>% .[`Posterior Instrumented Fusion` == 'Yes']  
   
data\_[, `Posterior Instrumented Fusion: Upper / Lower Levels`] %>%   
 sapply(. %>% strsplit('-') %>% .[[1]] %>% .[2]) ->  
 post\_intr\_fusion  
  
data\_[post\_intr\_fusion == 'Iliac', type := 'Iliac']  
data\_[post\_intr\_fusion == 'L5', type := 'L5']  
data\_ %<>% .[!is.na(type)]

### Confounding Variables

- Age  
- BMI\_First Visit  
- ASA classification  
- Prior Spine Surgery  
- Pelvic Tilt  
- Interbody Fusion  
- essg\_category  
- Number of Posterior Instrumented Levels  
- Decompression  
- Osteotomy  
- 3CO  
- Global Tilt  
- ODI - Score (%)  
- Site  
- RLL  
- Thoracolumbar L2-T10

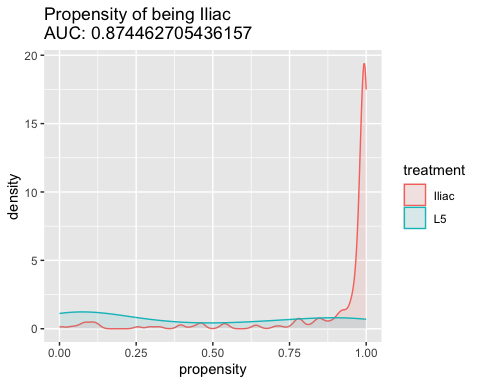
# Comparability constraints

data\_ %<>%   
 .[`Surgical Approach`=='Posterior'] %>%   
 .[`Pelvic Tilt` < 45] %>%   
 .[`Number of Posterior Instrumented Levels` < 17] %>%   
 .[`Global Tilt` < 60] %>%   
 .[`ASA classification` != '4'] %>%   
 .[`Thoracolumbar L2-T10` > -30 ] %>%   
 .[`Thoracolumbar L2-T10` < 70 ] %>%   
 .[`RLL` > -60]

type N  
1: Iliac 237  
2: L5 73

# Propensity Score

## Boosting



Propensity threshold 0.5

type N  
1: Iliac 207  
2: L5 30

# Average Treatment Effects

Change Outcome: 2Y. ODI - Score (%)  
RMSE: 1.32888822048642  
Relative RMSE: 6.7 %  
ATE (Iliac - L5): -9.58047791444532  
ATE (std Error) 2.17888585209726  
t.test p-value 1.69327193066625e-05  
  
  
Change Outcome: 2Y. SRS22 - SRS Subtotal score  
RMSE: 0.0495726528284099  
Relative RMSE: 6.8 %  
ATE (Iliac - L5): -0.0721174719723682  
ATE (std Error) 0.0808698025476717  
t.test p-value 0.373476058910738  
  
  
Change Outcome: 2Y. SF36 - MCS  
RMSE: 0.896089927582922  
Relative RMSE: 6.7 %  
ATE (Iliac - L5): -1.07743807793794  
ATE (std Error) 1.09954793743286  
t.test p-value 0.328267018428072  
  
  
Change Outcome: 2Y. SF36 - PCS  
RMSE: 0.703686782121747  
Relative RMSE: 7.2 %  
ATE (Iliac - L5): -2.24294672766921  
ATE (std Error) 0.999939878834479  
t.test p-value 0.0259359202916517  
  
  
Change Outcome: 2Y. Static Major curve Cobb angle  
RMSE: 0.973152067744869  
Relative RMSE: 7.5 %  
ATE (Iliac - L5): -4.62657097565091  
ATE (std Error) 1.29050171035725  
t.test p-value 0.000432119013134784  
  
  
Change Outcome: 2Y. Lordosis (top of L1-S1)  
RMSE: 0.951545166887523  
Relative RMSE: 6.5 %  
ATE (Iliac - L5): -1.20325395671017  
ATE (std Error) 1.14806471245832  
t.test p-value 0.295896320803158  
  
  
Change Outcome: 2Y. Global Tilt  
RMSE: 0.811024460208023  
Relative RMSE: 6.9 %  
ATE (Iliac - L5): -0.944936391325469  
ATE (std Error) 1.11049230981493  
t.test p-value 0.395854009522155  
  
  
Change Outcome: 2Y. Pelvic Tilt  
RMSE: 0.532771734585946  
Relative RMSE: 7 %  
ATE (Iliac - L5): -2.19773450295257  
ATE (std Error) 0.711027472114138  
t.test p-value 0.00228577187393805  
  
  
Change Outcome: 5Y. ODI - Score (%)  
RMSE: 1.76836118466453  
Relative RMSE: 8.9 %  
ATE (Iliac - L5): 2.75774494152846  
ATE (std Error) 2.19273353968641  
t.test p-value 0.210911541727986  
  
  
Change Outcome: 5Y. SRS22 - SRS Subtotal score  
RMSE: 0.062199166192734  
Relative RMSE: 9.1 %  
ATE (Iliac - L5): 0.0284262553052977  
ATE (std Error) 0.0875600388648952  
t.test p-value 0.745993988999313  
  
  
Change Outcome: 5Y. SF36 - MCS  
RMSE: 1.19235275273249  
Relative RMSE: 9.8 %  
ATE (Iliac - L5): -3.61196770213012  
ATE (std Error) 1.45933208036298  
t.test p-value 0.0150553219069787  
  
  
Change Outcome: 5Y. SF36 - PCS  
RMSE: 1.08698213407973  
Relative RMSE: 10.2 %  
ATE (Iliac - L5): 0.825846652605945  
ATE (std Error) 1.45847082235709  
t.test p-value 0.572550990958496  
  
  
Change Outcome: 5Y. Static Major curve Cobb angle  
RMSE: 1.79242901556703  
Relative RMSE: 12.2 %  
ATE (Iliac - L5): -6.8685459110184  
ATE (std Error) 1.91701800950919  
t.test p-value 0.000633632121515621  
  
  
Change Outcome: 5Y. Lordosis (top of L1-S1)  
RMSE: 1.67982512467705  
Relative RMSE: 10.6 %  
ATE (Iliac - L5): -11.3514169152839  
ATE (std Error) 2.60009368327724  
t.test p-value 4.10709335433955e-05  
  
  
Change Outcome: 5Y. Global Tilt  
RMSE: 1.44305187040768  
Relative RMSE: 10.9 %  
ATE (Iliac - L5): -9.81528041667834  
ATE (std Error) 2.12937708315885  
t.test p-value 1.67771684812189e-05  
  
  
Change Outcome: 5Y. Pelvic Tilt  
RMSE: 0.93600968641314  
Relative RMSE: 10.6 %  
ATE (Iliac - L5): -4.5308590703518  
ATE (std Error) 1.31516496270542  
t.test p-value 0.000949789491729802  
  
  
Outcome: major\_complications  
RMSE: 0.115837629370293  
Relative RMSE: 8.7 %  
ATE (Iliac - L5): -0.567282308587559  
ATE (std Error) 0.204011433443336  
t.test p-value 0.00611172770483612  
  
  
Outcome: reiqs  
RMSE: 0.110409821103728  
Relative RMSE: 9 %  
ATE (Iliac - L5): -0.266391195354468  
ATE (std Error) 0.155488452393506  
t.test p-value 0.0887046461557785