

STA 250 - Final Project

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March 21, 2014

1 About the Project

The point of this project was to create a web application that could be used by gastroenterologists to obtain a fast recommendation for when a patient should return after a colonoscopy. I used Shiny in R to create an app in which a doctor can enter in the results of a colonoscopy, and based off of official recommendations, generate a recommendation for interval of screening. These guidelines were obtained over many studies which are outlined in Liebermann et al.

2 ui.R

```
library(shiny)
```

```
shinyUI(pageWithSidebar(  
  
  headerPanel("2012 Recommendations for Surveillance and  
    Screening Intervals after Colonoscopy"),  
  
  sidebarPanel(  
    selectInput("polyp", "Polyps:", list("0", "1+small(<10mm) -  
      polyps in rectum or sigmoid")),  
    selectInput("sta", "Tubular Adenomas, small(<10mm):", list("0",  
      "1-2", "3-10", "10+")),  
    checkboxInput("lta", "1 or more Tubular Adenomas, large(> or =  
      10mm)", FALSE),  
    checkboxInput("va", "1 or more Villous Adenomas", FALSE),  
    checkboxInput("ahgd", "Adenoma with HGD", FALSE),
```

```

selectInput("sl", "Serrated_Polyps:", list("0", "Sessile_
  Serrated_Polyp(s),_small_(<10mm),_no_dysplasia", "Sessile_
  Serrated_Polyp(s),_large(>_or_=10mm)", "Sessile_Serrated_
  Polyp(s)_with_dysplasia")),
checkboxInput("sa", "Traditional_Serrated_Adenoma", FALSE),
checkboxInput("sps", "Serrated_Polyposis_Syndrome", FALSE) ),

mainPanel(
  verbatimTextOutput("recommendation")
)

) )

```

3 server.R

```

library(shiny)
library(datasets)

shinyServer(function(input, output){

  polypInput <- reactive({
    switch(input$polyp,
      "0" = 10, "1+_small_(<10mm)_polyps_in_rectum_or_sigmoid" =
        10)
  })

  staInput <- reactive({
    switch(input$sta,
      "0" = 10, "1-2" = 6, "3-10" = 3, "10+" = 2)
  })

  # ltaInput <- reactive({
  #   switch(input$lta,
  #     TRUE = 3, FALSE = 10)
  # })

  # vaInput <- reactive({
  #   switch(input$va,
  #     TRUE = 3, FALSE = 10)
  # })

```

```

#ahgdInput <- reactive({
#  switch(input$ahgd,
#    TRUE = 3, FALSE = 10)
# })
slInput <- reactive({
  switch(input$sl,
    "0" = 10, "Sessile_Serrated_Polyp(s),_small_(<10mm),_no_
    dysplasia" = 5,
    "Sessile_Serrated_Polyp(s),_large(>_or_=_10mm)" = 3, "
    Sessile_Serrated_Polyp(s)_with_dysplasia" = 3)
})
# saInput <- reactive({
#  switch(input$sa,
#    TRUE = 3, FALSE = 10)
# })
# spsInput <- reactive({
#  switch(input$sps,
#    TRUE = 1, FALSE = 10)
# })

output$recommendation <- renderPrint({
  polyp <- polypInput()
  sta <- staInput()
  # lta <- ltaInput()
  # va <- vaInput()
  # ahgd <- ahgdInput()
  sl <- slInput()
  # sa <- saInput()
  # sps <- spsInput()
  lta1 <- 10
  va1 <- 10
  ahgd1 <- 10
  sa1 <- 10
  sps1 <- 10
  if(input$lta == TRUE){lta1 <- 3}
  if(input$va == TRUE){va1 <- 3}
  if(input$ahgd == TRUE){ahgd1 <- 3}
  if(input$sa == TRUE){sa1 <- 3}
  if(input$sps == TRUE){sps1 <- 1}

  all = c(polyp, sta, lta1, va1, ahgd1, sl, sa1, sps1)

```

```

if(polyp == min(all)){
    rec = polyp
}
if(sta == min(all)){
    rec = sta
}
if(lta1 == min(all)){
    rec = lta1
}
if(val == min(all)){
    rec = val
}
if(ahgd1 == min(all)){
    rec = ahgd1
}
if(sl == min(all)){
    rec = sl
}
if(sa1 == min(all)){
    rec = sa1
}
if(sps1 == min(all)){
    rec = sps1
}

if(rec == 6){
    print("Recommended_interval_for_next_screening:_5_-_10_
        years")
}
else{
    if(rec == 2){
        print("Recommended_interval_for_next_screening:_less_than
            _3_years")
    }
    else{
        print(paste("Recommended_interval_for_next_screening:",
            rec, "years", sep = "_")
        ))
    }
}

```

})
})

4 References

Lieberman, David A., Douglas K. Rex, Sidney J. Winawer, Francis M. Giardiello, David A. Johnson, and Theodore R. Levin. "Guidelines for Colonoscopy Surveillance After Screening and Polypectomy: A Consensus Update by the US Multi-Society Task Force on Colorectal Cancer." *Gastroenterology* (2012): n. pag. Print.