Modeling Pre-hospital Triage Decisions for Patients with Suspected Stroke Due to Severe Large Vessel Occlusion

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Research Team:
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N.Y. 146
146
F.D. N.Y.
AMBULANCE
http://panic.mendelini.com/apparatus/ny/nyc/fdnyems/a146.html
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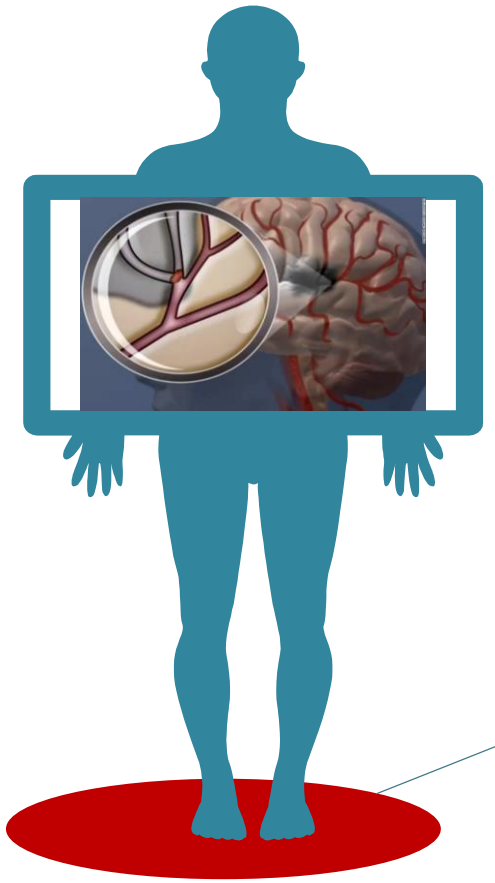
Acute Ischemic Stroke



ais_outcomes.py

```
99          # than the time to primary
100         if self.onset_needle_comprehensive < self.onset_needle_primary
101             return 'comprehensive center'
102         if ((self.onset_needle_primary < constants.time_limit_tpa())
103                 and (self.onset_evt_noship < constants.time_limit_evt
104             # Already initially set to false
105             return True
106         else:
107             if self.onset_needle_primary < constants.time_limit_tpa()
108                 return 'Primary'
109             else:
110                 return 'Comprehensive'
111
112     def get_ais_outcomes(self, key):
113         outcomes = None
114         if key == "Primary":
115             outcomes = self.run_primary_center()
116         elif key == "Comprehensive":
117             outcomes = self.run_comprehensive_center()
118         elif key == "Drip and Ship":
119             outcomes = self.run_primary_then_ship()
120         return outcomes
121
122     def run_primary_center(self):
123         '''
124         Returns the probability of a good outcome, the
125         and the proportion that got TPA by going straig
126         primary center
127         return {'p_good': p_good, 'p_tpa': p_tpa, 'p_e
128         '''
```

```
utcomes as ais
t
ants
e_random_sets as random_sets
al_strategy

 for simulation type are:
se Case' 2) 'Random Sets' 3) 'Input File'
ogle Maps'
ion Type': 'Base Case',
cations': {
titude and longitude of location
s.Coordinates(-40.2, -10.5),
nstants.Coordinates(-10.2, -5.5)

x.MALE,

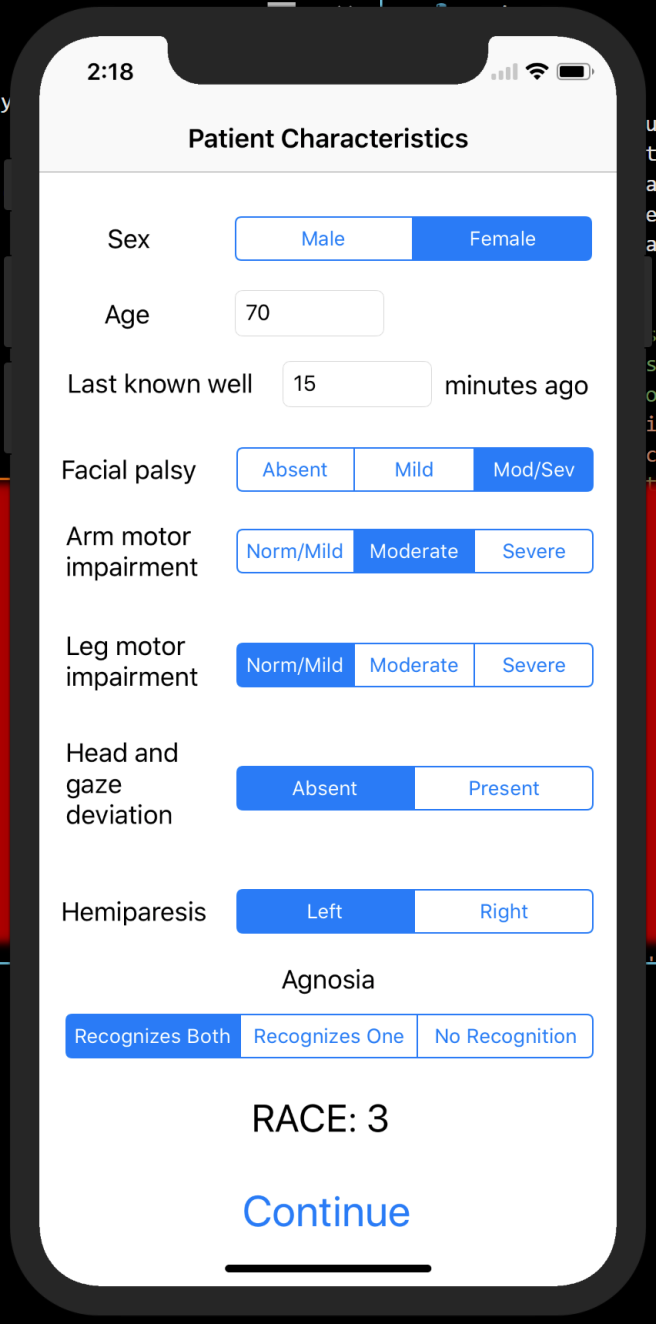
': 15,
14,
ive': 37,

ets': 15000,
x.MALE,
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

3: powershell

```
        Costs : 64227.8305942
Comprehensive results ->
        QALYs : 6.40545180774
        Costs : 64090.1989898
Primary results ->
        QALYs : 6.25054612612
        Costs : 67321.6871458
Optional Location -> Comprehensive
Maximum Benefit -> Comprehensive
Simulation time of 0.0270230770111084 seconds.
PS C:\Users\Ayman\Dropbox (Partners HealthCare)\stroke_project\
```



Approximate NIHSS: 7

ini.com/apparatus/ny/nyc/fdnyems/a146.html

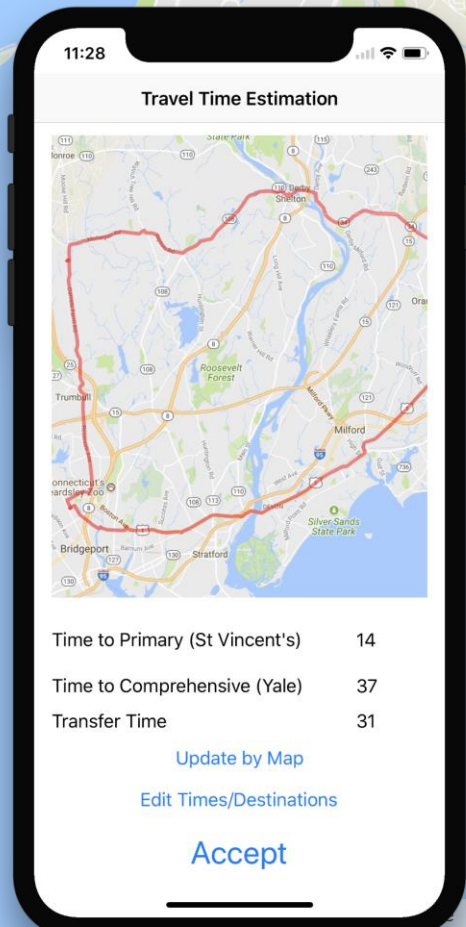
37 Minutes

14 Minutes

31 Minutes

Yale

St. Vincent's



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PS C:\Users\Ayman\Dropbox (Partners HealthCare)\stroke_project\model>
```

Finished running Stroke on iPhone 8

Sta...View › Hemiparesis Control

Patient Characteristics

Sex	Male	Female	
Age	Enter Age		
Last known well	Enter Time	minutes ago	
Facial palsy	Absent	Mild	Mod/Sev
Arm motor	Norm/Mild	Moderate	Severe
Leg motor	Norm/Mild	Moderate	Severe
Head and gaze deviation	Absent	Present	
Hemiparesis	Left	Right	
Agnosia			
Recognizes Both	Recognizes One	No Recognition	

RACE: 0

Continue

View as: iPhone 8 (wC hR) — 100% +

Device Orientation Vary for Traits

Manual › PatientViewController.swift › upda

```
@IBOutlet weak var raceLabel: UILabel!

override func viewDidLoad() {
    super.viewDidLoad()

    // Do any additional setup after loading
}

override func didReceiveMemoryWarning() {
    super.didReceiveMemoryWarning()
    // Dispose of any resources that can be
}

@IBAction func updateAgnosia(_ sender: Any)
    guard let hemiparesis = Hemiparesis(rawV
        hemiparesisControl.selectedSegmentIn
        return
    }
    if stateController?.hemiparesis == hemip
        // The state hasn't changed
        return
    }

    switch hemiparesis {
    case .left:
        agnosiaControl.setTitle("Recognizes
        agnosiaControl.setTitle("Recognizes
        agnosiaControl.setTitle("No Recognit
    case .right:
        agnosiaControl.setTitle("Both Tasks"
        agnosiaControl.setTitle("One Task",
        agnosiaControl.setTitle("Neither Tas
    }
    // Because we assume this has changed, w
        value
    agnosiaControl.selectedSegmentIndex = 0

    updateStateController(sender)
}

@IBAction func updateStateController(_ sende
    guard let stateController = stateControl
        return
    }
    stateController.sex = Sex(rawValue:
        sexControl.selectedSegmentIndex)
    if let ageText = ageTextField.text {
        stateController.age = Int(ageText)
    }
    if let lastKnownText = lastKnownTextFiel
        stateController.time_since_symptoms
    }
    stateController.facial_palsy = Palsy(raw
        palsyControl.selectedSegmentIndex)
    stateController.arm_motor_impairment = M
        armControl.selectedSegmentIndex)
    stateController.leg_motor_impairment = M
        legControl.selectedSegmentIndex)
    stateController.head_and_gaze_deviation
        HeadAndGazeDeviation(rawValue:
        deviationControl.selectedSegmentInde
```

Optimal Destination for Linda: Drip and Ship

Parameter Sources

Mortality by mRS score: Hong 2010
Proportion of patients in good outcomes by mRS: Saver 2016
Safety of thrombolytics in stroke mimics: Tsivgoulis 2015
True state of patients with suspected stroke (pre-hospital setting): Kothari 1995
Quality of life by mRS: Rangaraju 2017
Baseline mortality by NIHSS score: Fonarow 2012
Costs by mRS: Dewilde 2017 and Wang 2015
Cost of IV-tPA and EVT: National in-patient sample