Appendix: Supplementary Tables, Statistical Code and Calculations

Table S1 Model Comparisons and Variable Selection

MODEL (# of variables)	Full (10) *	Full $_{LT}$ (10)*	Reduced$_{LT}$, A (8)*	Reduced$_{LT}$, B (6)*	Parsimonious $_{LT}$ (5)*	ACR (4)
Included covariates that were not statistically significant	Sex, New headache, Temporal artery abnormality, Diplopia, CRP	Sex, New headache, Temporal artery abnormality, Diplopia, log ESR	New headache, Temporal artery abnormality, log ESR	Temporal artery abnormality		New headache (Age category omitted)
AUROC	.8084	.8196	.8185	.8163	.8164	.6339
p $_{Hosmer-Lemeshow}$	.3590	.5485	.1722	.0182	.8115	.2227
Brier score	.1381	.1313	.2434	.2426	.1335	.1792
p $_{Spiegelhalter\ z\text{-}test}$	.4833	.5811	<.001	<.001	.6662	.5213
AIC	480.6595	466.2297	462.7570	460.603	461.0216	576.4964
BIC	527.6611	513.2314	501.2129	490.5135	486.6589	593.5500
Internal validation AUROC		0.803 (95% CI 0.757, 0.849)			0.810 (95% CI 0.766, 0.854).	
External validation AUROC		Range 0.688, 0.824			Range 0.750, 0.845	

LT = log transformed covariates. The CRP and ESR were skewed distributions and log transformed for model fitting.

*The statistically significant predictors were: Age, Jaw claudication, Ischemic vision loss, Platelets, and CRP in the non-log transformed model. In the log transformed model lnCRP replaced the CRP and lnESR replaced the ESR

The Brier score has both a calibration and discrimination (sharpness) component. A statistically significant value of Spiegelhalter's z-test (evaluated at α=0.05), indicates poor calibration. (1)

ACR= American College of Rheumatology non-histologic criteria. None of the patients with positive temporal artery biopsy were under age 50 years old and the age category was omitted on logistic regression.

Table S2 Model Performance for each prediction model at its optimal cutpoint (Liu method)

	Full Model	Parsimonious Model	ACR Model
ACR Model **Optimal Cutpoint 0.294**			
Sensitivity Specificity False Negative Rate Misclassification rate	0.68 0.81 0.32 0.22	0.65 0.82 0.35 0.23	0.47 0.78 0.53 0.30
Parsimonious Model **Optimal Cutpoint 0.265**			
Sensitivity Specificity False Negative Rate Misclassification rate	0.70 0.79 0.21 .23	0.73 0.78 0.28 0.23	0.54 0.67 0.46 0.35
Full Model **Optimal Cutpoint 0.242**			
Sensitivity Specificity False Negative Rate Misclassification rate	0.74 0.77 0.25 0.24	0.73 0.77 0.27 0.24	0.67 0.49 0.32 0.46

Figure S1

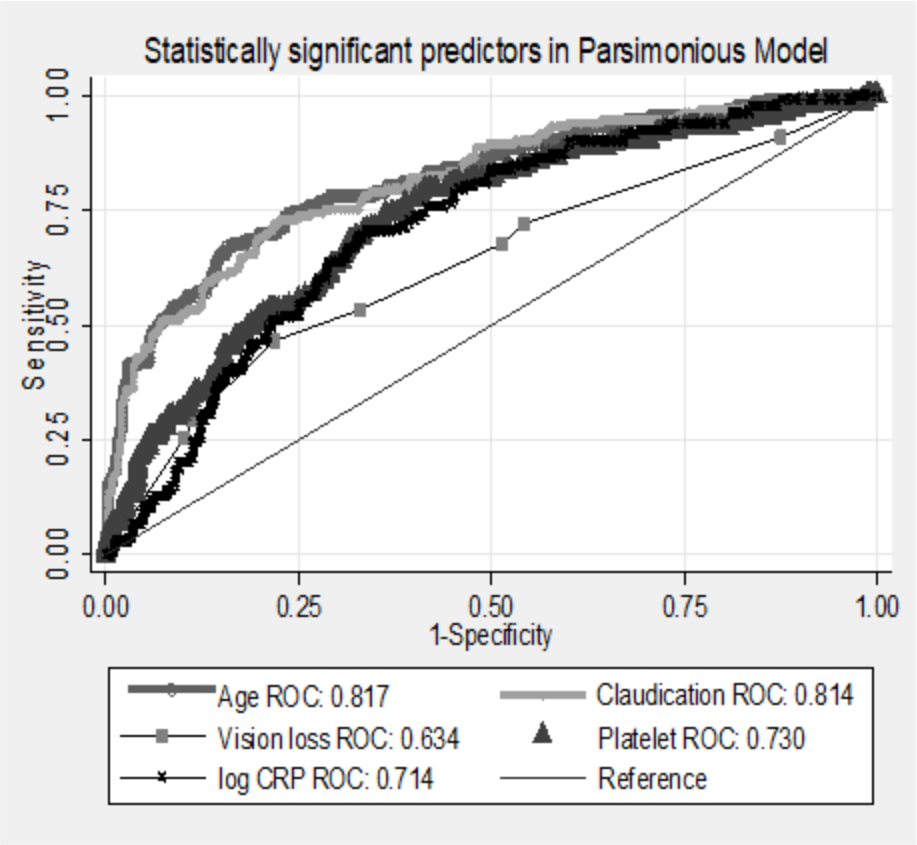
Statistically significant predictors in Parsimonious Model
Sensitivity
0.00
0.25
0.50
0.75
1.00
1-Specificity
Age ROC: 0.817
Claudication ROC: 0.814
Vision loss ROC: 0.634
Platelet ROC: 0.730
log CRP ROC: 0.714
Reference

Table S3 Comparison of Prediction Rule Studies in the Literature

Author (Year)	N (positive biopsy events)	Statistically Significant Predictors	Odds Ratio
Gabriel (1995)	525 (172)	All claudication Synovitis TA Abn Px Highest ESR	4.55 0.31 2.55 1.01
Rodriguez-Valverde, (1997)	227 (90)	New headache TA Abn Px Jaw claudication Raised liver enzymes < 70 years old at disease onset	13.6 4.2 4.8 2.9 0.11
Rieck (2011)	82 (22)	Jaw claudication Weight loss	4.50 3.76
Gonzalez-Lopez (2013)	335 (81)	Jaw claudication New headache TA Abn Px Pain and stiffness in neck and shoulders Unintentional weight loss Age Biopsy Length ESR	4.6 4.4 2.8 2.3 1.33 1.085 1.079 1.042
De Lott (2015)	239 for logistic regression (?90)	Age Platelets	1.06 1.01
Grossman (2016)	224 (57) [included 25 biopsy negative GCA]	New headache Jaw claudication ESR Platelet count	6.0 4.5 1.5 1.74
Present study (2017)	530 (133)	Jaw Claudication Vision Loss Platelet LogCRP Age	4.0 2.7 1.005 1.35 1.04

GCA = giant cell arteritis

TA Abn Px = temporal artery abnormality on physical exam

COMMENTS ON THE GCA CALCULATOR

The calculator is meant to objectify decision-making when discussing management options with patients with suspected GCA. The calculator only predicts **biopsy-proven** GCA.

We encourage you to interpret the probability score with respect to the cutpoints. For scores lower than 15%, ask your patient, "Given GCA is a potentially blinding disease, and there is a _% chance you might have GCA, do you want to proceed with TABx and steroids, or do you want to continue observation?"

None of the 133 biopsy proven GCA patients had a probability score below 2.7%

7.5% of the patients with biopsy proven GCA had a normal platelet, and normal ESR and normal CRP level pre-steroid; the average probability score on this seronegative group was 11%.

Female gender and diplopia were NOT helpful predictors of GCA in this study. You will see the risk score goes down for females and patients with diplopia. More females had GCA than males, but more females also had negative biopsy. In this series 35% with biopsy proven GCA had vision loss. Perhaps the high incidence of vision loss made binocular diplopia unlikely and that may be why the diplopia variable performs this way on the calculator.

STATISTICAL PROGRAMS: Stata 14.2, JMP Pro 13

CODEBOOK FOR VARIABLES

VARIABLE NAME	MEANING		TYPE OF VARIABLE
Outcome variable			
tabxneg0	*Temporal artery biopsy pathology result*	*Positive =1 Negative=0*	*binary*
Predictor variables			
age	Age in years		continuous
female1	Gender	Female=1 Male = 0	binary
newheadache	Recent onset headache	1= new headache 0= no new headache	binary

taabnormality	Tender or pulseless temporal artery or scalp tenderness/nodule	1= present 0= absent	binary
Jawclaudication1	Jaw claudication + (tongue claudication)	1=claudication	binary
discrao	Permanent vision/field loss (disc edema, retinal artery occlusion, PION) In article = VL	1 = vision loss 0= no vision loss	binary
Diplopia1	Diplopia symptoms	1= diplopia present	binary
platelet			
lncrp	Natural log CRP + constant	Ln (CRP divided by ULN) +3.69	continuous
lnesr	Natural log Westergren ESR + constant	ln(ESR) + 4.61	continuous
length	Biopsy length in cm	Posthoc analysis (not a predictor)	continuous
fl530pr1	Probability of positive biopsy, full model		continuous
pabicpr1	Probability of positive biopsy, parsimonious model		continuous
acrpob1	Probability of positive biopsy ACR model		continuous
esrcat	ESR>=50 == 1 for ACR		binary
agecat	Age >=50 ==1 for ACR		binary

code3	region		Categorical string
code4	Numeric region code		categorical
nlbloodtabxpos1	Biopsy positive but Platelets<400, ESR<50 and CRP <=1		binary

METHOD SECTION

KATTAN NOMOGRAM CONSTRUCTION

Skewed data was normalized by the logarithmic function and constants were added to provide positive results for the Kattan nomogram. For the ESR the constant 4.61 was added to the logESR, and for the CRP the constant 3.69 was added to the logCRP so that there were no negative values for the later Kattan nomogram. For ease of use, the logarithmic transforms were converted back to ESR and CRP values in the nomogram scales.

RESULTS SECTION

TABLE 1

```
table1, by( tabxneg0) vars( age contn \ female1 bin \ newheadache bin
\ taabnormality bin \ jawclaudication1 bin \platelet contn \ origesr
conts \ crp conts \ discrao bin \ Diplopia1 bin \ length contn)
saving(Table3GCA.xls)
```

UNIVARIATE LOGISTIC REGRESSION

```
foreach x of varlist age female1 newheadache taabnormality jawclaudication1 platelet
origesr crp discrao  Diplopia1 {
logistic tabxneg0 `x'
}
*
```

"SERONEGATIVE" GCA

```
generate nlbloodtabxpos1 = 0
replace nlbloodtabxpos1 =1 if origesr<50 & crp <=1 & platelet<400 &tabxneg0==1
tabstat age female1 newheadache newheadache taabnormality jawclaudication1 discrao Diplopia1
length platelet origesr crp if tabxneg0==1, statistics( mean sd count ) by(nlbloodtabxpos1)
Summary statistics: mean, sd, N
 by categories of: nlbloodtabxpos1
nlbloodtabxpos1 |      age    female1  newhea~e  newhea~e  taabno~y  jawcla~1   discrao  Diplop~1
       length  platelet   origesr     crp
----------------+----------------------------------------------------------------------------
----------------------------------------
              0 |  77.06748   .6585366   .7642276   .7642276   .5121951   .4878049   .3577236
.0650407  1.915306            395  58.39443  13.77265
```

```
              |  7.778464    .47614   .4262167   .4262167   .5018956   .5018956   .4812906   .2476062
.580322   140.3226   29.93112   14.76352
              |       123         123        123        123         123        123        123
123           98        123         123        123
--------------+-------------------------------------------------------------------------------
--------------------------------------
              1 |    73.22          .7       .7       .7       .1       .3       .3       0    2.0125
278.8          22.1   .3998333
              |  7.912972   .4830459   .4830459   .4830459   .3162278   .4830459   .4830459
0    .710005   36.57807    13.2619   .2253101
              |       10        10        10        10        10        10        10        10        8        10
10       10
--------------+-------------------------------------------------------------------------------
--------------------------------------
       Total |   76.7782   .6616541   .7593985   .7593985    .481203   .4736842   .3533835   .0601504
1.922642   386.2632   55.66553   12.76718
              |  7.824779   .4749357   .4290648   .4290648   .5015356   .5011947   .4798278   .2386642
.5876966   138.6938   30.53335   14.62812
              |       133        133         133        133        133         133        133        133
       106     133        133         133
-------------------------------------------------------------------------------------------------
--------------------------------------
foreach x of varlist age female1 newheadache taabnormality jawclaudication1 discrao
Diplopia1 platelet origesr crp length  {
ttest `x' if tabxneg0==1, by(nlbloodtabxpos1)
}
```

SHORT TEMPORAL ARTERY BIOPSIES

```
tabstat length if length <1.5, statistics( count mean sd ) by(tabxneg0)
Summary for variables: length
       by categories of: tabxneg0
tabxneg0 |          N      mean          sd
---------+----------------------------
       NEG |        118  1.051271   .2626673
       POS |         23  1.030435    .242027
---------+----------------------------
  Total |        141  1.047872   .2586968
------------------------------------------
ttesti 118 1.051271 .2626673 23 1.030435 .242027
Two-sample t test with equal variances
------------------------------------------------------------------------------
       |     Obs     Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       x |     118  1.051271      .0241805    .2626673       1.003383      1.099159
       y |      23  1.030435      .0504661     .242027       .9257747      1.135095
---------+--------------------------------------------------------------------
combined |   141    1.047872    .0217862       .2586968      1.0048    1.090945
---------+--------------------------------------------------------------------
       diff |               .020836       .0591505                -.0961151    .1377871
------------------------------------------------------------------------------
       diff = mean(x) - mean(y)                                      t =   0.3523
Ho: diff = 0                                     degrees of freedom =      139
       Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
Pr(T < t) = 0.6374         Pr(|T| > |t|) = 0.7252          Pr(T > t) = 0.3626
```

```
sum length, detail, if tabxneg0==0
                          length
-------------------------------------------------------------
      Percentiles   Smallest
1%            .5            .1
5%            .8            .4
10%           1             .4     Obs                 376
25%           1.3           .5      Sum of Wgt.        376
50%           1.8                         Mean          1.848005
                    Largest       Std. Dev.    .6952717
75%           2.5           3.8
90%           2.5           4.2    Variance     .4834027
95%             2.6             4.3       Skewness     .2796604
99%           3.8           4.6    Kurtosis     3.321012
sum length, detail, if tabxneg0==1
                          length
-------------------------------------------------------------
      Percentiles   Smallest
1%            .7            .6
5%            .8            .7
10%           1             .8     Obs                 106
25%           1.5           .8     Sum of Wgt.         106
50%           2                    Mean           1.922642
                    Largest       Std. Dev.    .5876966
75%           2.5           2.6
90%           2.5           2.7    Variance     .3453872
95%           2.6           2.8    Skewness     -.5285843
99%           2.8             3       Kurtosis         2.200076
```

CHOICE OF FULL MODEL TO MINIMIZE AIC AND BIC

Full model: nontransformed esr crp

```
-----------------------------------------------------------------------------
      Model |       Obs  ll(null)  ll(model)   df         AIC      BIC
------------+----------------------------------------------------------------
       . |          530 -298.5857  -229.3297      11 480.6595   527.6611
-----------------------------------------------------------------------------
```

Full model: lnesr, crp

```
-----------------------------------------------------------------------------
       Model |      Obs  ll(null)  ll(model)   df         AIC      BIC
-------------+---------------------------------------------------------------
       . |          530 -298.5857  -226.6329      11 475.2658   522.2674
-----------------------------------------------------------------------------
```

Full model: esr, lncrp

```
-----------------------------------------------------------------------------
       Model |      Obs  ll(null)  ll(model)   df         AIC      BIC
-------------+---------------------------------------------------------------
       . |        530 -298.5857  -222.7568      11    467.5137   514.5153
-----------------------------------------------------------------------------
```

Full model: lnesr, lncrp

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	530	-298.5857	-222.1149	11	466.2297	513.2314

In the non-transformed full model, the ESR was statistically significant (p=0.029 with p_{MICE}=0.30), but the CRP (p=0.762 with p_{MICE}=0.651) was not. However the full model with the log transformed CRP (p=.003) and log transformed ESR (p=.273) was chosen because it had lower AIC and BIC.

NO SPECIFICATION ERROR (Stata "linktest")

FULL MODEL

```
. logit tabxneg0 age female1 newheadache taabnormality jawclaudication1 platelet crp
origesr discrao Diplopia1, nolog
Logistic regression                               Number of obs      =       530
                                                  LR chi2(10)        =    138.51
                                                  Prob > chi2        =    0.0000
Log likelihood = -229.32973                       Pseudo R2          =    0.2319
------------------------------------------------------------------------------
      tabxneg0 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
           age |    .0465098   .0128504     3.62   0.000     .0213234    .0716961
      female1 |   -.2353226   .2571522    -0.92   0.360    -.7393318    .2686865
  newheadache |    .2044438   .2854474     0.72   0.474    -.3550228    .7639105
taabnormality |    .4003271   .2554037     1.57   0.117    -.1002551    .9009092
jawclaudica~1 |    1.335526   .2592266     5.15   0.000     .8274509    1.843601
      platelet |    .0060248   .0010619     5.67   0.000     .0039435    .0081061
           crp |    .0028098   .0092628     0.30   0.762     -.015345    .0209645
      origesr |    .0089525   .0040991     2.18   0.029     .0009183    .0169866
      discrao |    .9951831   .2753072     3.61   0.000      .455591    1.534775
     Diplopia1 |   -.0639864   .5051335    -0.13   0.899     -1.05403     .926057
        _cons |   -7.855003   1.121877    -7.00   0.000    -10.05384    -5.656165
------------------------------------------------------------------------------
. linktest, nolog
Logistic regression                               Number of obs      =       530
                                                  LR chi2(2)         =    138.71
                                                  Prob > chi2        =    0.0000
Log likelihood = -229.23054                       Pseudo R2          =    0.2323
------------------------------------------------------------------------------
      tabxneg0 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
       _hat |    1.046251   .1490225     7.02   0.000  .7541728     1.33833
      _hatsq |    .0294055   .0662836    0.44   0.657  -.1005079    .1593189
       _cons |   -.0207729   .1574102    -0.13   0.895  -.3292911    .2877454
------------------------------------------------------------------------------
```

FULL MODEL WITH LOG TRANSFORMED ESR CRP

```
. logit tabxneg0 age female1 newheadache taabnormality jawclaudication1 platelet lncrp
lnesr discrao Diplopia1, nolog
Logistic regression                                     Number of obs     =        530
                                                        LR chi2(10)       =     152.94
                                                        Prob > chi2       =     0.0000
Log likelihood = -222.11487                             Pseudo R2         =     0.2561
------------------------------------------------------------------------------
      tabxneg0 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
           age |    .0449871   .0131698     3.42   0.001     .0191748   .0707993
      female1 |   -.1523935   .2610758    -0.58   0.559    -.6640926   .3593057
  newheadache |    .2306857   .2895042     0.80   0.426    -.3367321   .7981035
 taabnormality |    .3563223   .2609711     1.37   0.172    -.1551716   .8678162
jawclaudication1 |    1.296339   .2636562     4.92   0.000     .7795826    1.813096
      platelet |    .0050691   .0010637     4.77   0.000     .0029844   .0071538
      lncrp |    .2901259   .0980896     2.96   0.003     .0978738   .4823779
      lnesr |    .1870691    .170521     1.10   0.273    -.1471459   .5212841
      discrao |     1.03084   .2806157     3.67   0.000     .4808433   1.580836
      Diplopia1 |    -.229284   .5020145    -0.46   0.648    -1.213214   .7546464
      _cons |    -9.96761   1.600932    -6.23   0.000    -13.10538   -6.829841
------------------------------------------------------------------------------
. linktest, nolog
Logistic regression                                     Number of obs     =        530
                                                        LR chi2(2)        =     154.36
                                                        Prob > chi2       =     0.0000
Log likelihood = -221.40814                             Pseudo R2         =     0.2585
------------------------------------------------------------------------------
      tabxneg0 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
       _hat |    1.124489   .1516177     7.42   0.000  .8273235    1.421654
      _hatsq |    .0723567   .0606377     1.19   0.233 -.0464911    .1912045
      _cons |   -.0515301   .1562692    -0.33   0.742 -.3578121    .2547519
------------------------------------------------------------------------------
```

A SMALL ODDS RATIOS MAY BE SEEMINGLY UNIMPORTANT, BUT PLATELETS WERE A CONTINOUS COVARIATE with wide range. The odds ratio for platelets is **1.005** with β .0050691. Although a 1 unit change in platelets may be a small difference, and the odds ratio for platelets seemingly unimportant a 10 unit increase in platelets has effect e^(βplatelets*10) =e^(.0050691*10) = 1.05X increase in the odds ratio. A 50 unit increase in platelets results in a e^(.005691*50) = 1.29X increase in the odds.

PARSIMONIOUS MODEL

```
logit tabxneg0 age jawclaudication1 platelet lncrp discrao, nolog
Logistic regression                                     Number of obs     =        530
                                                        LR chi2(5)        =     148.15
                                                        Prob > chi2       =     0.0000
```

```
Log likelihood =  -224.5108                     Pseudo R2           =     0.2481
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
           age |   .0438666   .0129774     3.38   0.001     .0184314   .0693019
jawclaudication1 |   1.402289   .2527095     5.55   0.000    .9069877    1.897591
      platelet |   .0050816   .0010462     4.86   0.000      .003031   .0071321
      lncrp |   .3581129   .0800815     4.47   0.000     .2011559   .5150698
      discrao |   .9248225   .2686439     3.44   0.001     .3982902   1.451355
      _cons |   -8.49572   1.127081    -7.54   0.000    -10.70476   -6.286681
------------------------------------------------------------------------------
. linktest, nolog
Logistic regression                               Number of obs     =        530
                                                  LR chi2(2)        =     148.68
                                                  Prob > chi2       =     0.0000
Log likelihood = -224.24784                       Pseudo R2         =     0.2490
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
       _hat |   1.073897   .1472921     7.29   0.000    .7852101    1.362585
      _hatsq |    .045486   .0627132     0.73   0.468   -.0774296    .1684017
      _cons |  -.0343638   .1566749    -0.22   0.826    -.341441    .2727135
------------------------------------------------------------------------------
```

ACR MODEL (5 subjects less than 50 years of age, all had negative TABx)

```
logit tabxneg0 agecat esrcat newheadache taabnormality, nolog
note: agecat != 1 predicts failure perfectly
      agecat dropped and 5 obs not used
Logistic regression                               Number of obs     =        525
                                                  LR chi2(3)        =      25.77
                                                  Prob > chi2       =     0.0000
Log likelihood = -284.24822                       Pseudo R2         =     0.0434
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
      agecat |           0  (omitted)
      esrcat |   .8195679   .2070725     3.96   0.000     .4137132   1.225423
 newheadache |   .0979034   .2451079     0.40   0.690    -.3824992   .5783061
taabnormality |   .5792912   .2143856     2.70   0.007     .1591032    .9994792
      _cons |  -1.738102   .2369044    -7.34   0.000    -2.202426   -1.273778
linktest, nolog
Logistic regression                               Number of obs     =      525
                                                  LR chi2(2)        =      27.32
                                                  Prob > chi2       =     0.0000
Log likelihood = -283.47458                       Pseudo R2         =     0.0460
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
       _hat |   2.036413   .8596832     2.37   0.018    .3514652    3.721361
      _hatsq |   .5234275   .421919     1.24   0.215   -.3035185    1.350374
```

```
       _cons |   .3707679   .3752286     0.99   0.323 -.3646667     1.106203
------------------------------------------------------------------------------
```

NO MULTICOLLINEARITY

```
collin age female1 newheadache taabnormality jawclaudication1 platelet crp origesr
discrao Diplopia1
(obs=530)
 Collinearity Diagnostics
                        SQRT                   R-
 Variable           VIF    VIF    Tolerance    Squared
----------------------------------------------------
       age          1.02   1.01    0.9803      0.0197
  female1           1.05   1.02    0.9549      0.0451
newheadache         1.10   1.05    0.9060      0.0940
taabnormality        1.15  1.07    0.8718      0.1282
jawclaudication1    1.09   1.05    0.9153      0.0847
 platelet           1.19   1.09    0.8424      0.1576
       crp          1.45   1.21    0.6880      0.3120
  origesr           1.39   1.18    0.7220       0.2780
  discrao           1.09   1.04    0.9168      0.0832
Diplopia1           1.02   1.01    0.9839      0.0161
----------------------------------------------------
 Mean VIF           1.15

                       Cond
       Eigenval        Index
---------------------------------
       1     6.4979        1.0000
       2     0.9639        2.5965
       3     0.9080        2.6751
       4     0.7584        2.9271
       5     0.6696        3.1151
       6     0.4741        3.7021
       7     0.2660        4.9424
       8     0.2211        5.4215
       9     0.1496        6.5901
       10     0.0831       8.8408
       11     0.0082       28.0948
---------------------------------
Condition Number           28.0948
Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix)    0.4855
. collin age female1 newheadache taabnormality jawclaudication1 platelet lncrp lnesr
discrao Diplopia1
(obs=530)
 Collinearity Diagnostics
                        SQRT                   R-
 Variable           VIF    VIF    Tolerance    Squared
----------------------------------------------------
       age          1.03   1.01    0.9740      0.0260
  female1           1.03   1.02    0.9686      0.0314
```

```
newheadache          1.10    1.05    0.9080      0.0920
taabnormality        1.16   1.08    0.8653       0.1347
jawclaudication1     1.09     1.04 0.9180        0.0820
 platelet            1.21    1.10    0.8231      0.1769
       lncrp         1.68    1.30    0.5949      0.4051
       lnesr         1.49    1.22    0.6724      0.3276
  discrao            1.09    1.04    0.9199      0.0801
Diplopia1            1.02    1.01    0.9780      0.0220
-----------------------------------------------------
 Mean VIF          1.19
                           Cond
       Eigenval            Index
---------------------------------
       1     7.2943        1.0000
       2     0.9529        2.7668
       3     0.9001        2.8468
       4     0.6771        3.2822
       5     0.4764        3.9131
       6     0.2867        5.0440
       7     0.2299        5.6334
       8     0.0937        8.8239
       9     0.0700        10.2054
       10     0.0131       23.5941
       11     0.0059       35.0522
---------------------------------
Condition Number           35.0522
Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix)    0.4313
```

PARSIMONIOUS MODEL

```
collin age jawclaudication1 platelet lncrp discrao
(obs=530)
 Collinearity Diagnostics
                        SQRT                    R-
 Variable           VIF    VIF    Tolerance    Squared
-----------------------------------------------------
       age          1.01   1.01    0.9869      0.0131
jawclaudication1    1.02    1.01 0.9796        0.0204
 platelet           1.18   1.09    0.8475        0.1525
       lncrp        1.16   1.08    0.8621      0.1379
  discrao           1.03   1.01    0.9716      0.0284
-----------------------------------------------------
 Mean VIF           1.08
                           Cond
       Eigenval            Index
---------------------------------
       1     4.4175        1.0000
       2     0.7825        2.3760
       3     0.6201        2.6690
       4     0.0930        6.8934
       5     0.0784        7.5068
```

```
       6     0.0085        22.7935
--------------------------------
Condition Number           22.7935
Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix)    0.8271
```

ACR MODEL

```
collin agecat esrcat newheadache taabnormality
(obs=530)
 Collinearity Diagnostics
                        SQRT                    R-
 Variable      VIF VIF     Tolerance    Squared
----------------------------------------------------
       agecat      1.00    1.00    0.9955      0.0045
       esrcat      1.01    1.01    0.9854      0.0146
newheadache 1.06    1.03 0.9432         0.0568
taabnormality   1.06    1.03     0.9453        0.0547
----------------------------------------------------
 Mean VIF      1.03

                           Cond
       Eigenval            Index
---------------------------------
       1     3.7179        1.0000
       2     0.5965        2.4965
       3     0.5034        2.7178
       4     0.1775        4.5764
       5     0.0046        28.3254
---------------------------------
Condition Number           28.3254
Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix)    0.9365
```

There was NO specification error in our logistic regression models. There was no multicollinearity; the mean variance inflation factor (VIF) was 1.19, all of the predictor VIF were in the range of one with maximum 1.68 , and lowest observed tolerance 0.595 associated with the log CRP.

MULTIPLE IMPUTATION of non-log transformed data

```
mi set wide
mi register imputed platelet crp origesr newheadache taabnormality discrao Diplopia1
jawclaudication1
.
mi register regular tabxneg0 age female1
mi impute chained (regress) platelet (regress) crp (regress) origesr (logit)
newheadache (logit)taabnormality (logit) discrao
> (logit) Diplopia1 (logit) jawclaudication1 = tabxneg0 age female1, add(250)
rseed(4409)
note: variables discrao Diplopia1 contain no soft missing (.) values; imputing nothing
Conditional models:
```

```
      newheadache: logit newheadache i.discrao i.Diplopia1 i.jawclaudication1
i.taabnormality platelet crp origesr tabxneg0
                   age female1
      jawclaudicat~1: logit jawclaudication1 i.discrao i.Diplopia1 i.newheadache
i.taabnormality platelet crp origesr tabxneg0
                   age female1
      taabnormality: logit taabnormality i.discrao i.Diplopia1 i.newheadache
i.jawclaudication1 platelet crp origesr tabxneg0
                   age female1
      platelet: regress platelet i.discrao i.Diplopia1 i.newheadache
i.jawclaudication1 i.taabnormality crp origesr
                   tabxneg0 age female1
            crp: regress crp i.discrao i.Diplopia1 i.newheadache i.jawclaudication1
i.taabnormality platelet origesr
                 tabxneg0 age female1
      origesr: regress origesr i.discrao i.Diplopia1 i.newheadache i.jawclaudication1
i.taabnormality platelet crp
                   tabxneg0 age female1
Performing chained iterations ...
Multivariate imputation                     Imputations =   250
Chained equations                                 added =   250
Imputed: m=1 through m=250                      updated =         0
Initialization: monotone                     Iterations = 2500
                                             burn-in =    10
      platelet: linear regression
             crp: linear regression
      origesr: linear regression
      newheadache: logistic regression
      taabnormality: logistic regression
      discrao: logistic regression
      Diplopia1: logistic regression
      jawclaudicat~1: logistic regression
------------------------------------------------------------------
                 |              Observations per m
                 |----------------------------------------------
      Variable   |   Complete   Incomplete   Imputed |     Total
-----------------+--------------------------------------+----------
      platelet   |       561      127        127 |        688
           crp   |       530      158        158 |        688
        origesr  |       530      158        158 |        688
      newheadache |       686        2          2 |        688
     taabnormality |       679        9          9 |        688
          discrao |       688        0          0 |        688
      Diplopia1 |       688        0          0 |        688
      jawclaudicat~1 |    683        5          5 |        688
------------------------------------------------------------------
(complete + incomplete = total; imputed is the minimum across m
of the number of filled-in observations.)
. mi misstable patterns platelet crp origesr newheadache taabnormality
jawclaudication1 discrao Diplopia1
```

```
      Missing-value patterns
      (1 means complete)
             |   Pattern
   Percent   |  1  2  3  4        5  6
 ------------+--------------------
      77%    |  1  1  1  1        1  1
             |
      17     |  1  1  1  0        0  0
      3      |  1  1  1  1        0  0
      <1     |  1  1  0  1        0  0
      <1     |  1  0  1  0        0  0
      <1     |  1  1  0  0        0  0
      <1     |  0  0  0  0        0  0
      <1     |  0  1  1  1        0  0
      <1     |  1  0  1  1        0  0
 ------------+--------------------
      100%   |
 Variables are  (1) newheadache  (2) jawclaudication1  (3) taabnormality  (4) platelet
(5) crp  (6) origesr
mi estimate:  logit tabxneg0 age female1 newheadache taabnormality jawclaudication1
platelet crp origesr discrao Diplopia1
Multiple-imputation estimates                    Imputations        =       250
Logistic regression                              Number of obs      =       688
                                                 Average RVI        =    0.0912
                                                 Largest FMI        =    0.2232
DF adjustment:   Large sample                    DF:     min        =  5,013.54
                                                         avg        = 204,747.63
                                                         max        = 632,370.74
Model F test:       Equal FMI                    F(  10,313092.7)   =     11.46
Within VCE type:          OIM                    Prob > F           =    0.0000
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
          age |   .0522735   .0113708     4.60   0.000     .029987   .0745599
      female1 |   .0268705   .2319645     0.12   0.908    -.4277741   .4815152
  newheadache |   .0575915   .2500353     0.23   0.818    -.4324713   .5476543
 taabnormality |   .4809197   .2290257     2.10   0.036     .0320287   .9298107
jawclaudication1 |  1.39079   .2254004     6.17   0.000     .949009    1.83257
      platelet |   .0058186   .0010184     5.71   0.000     .0038221   .007815
          crp |   .0041638   .0092029     0.45   0.651    -.0138769   .0222044
      origesr |   .0088631   .0040743     2.18   0.030     .0008757   .0168505
      discrao |   .9189811   .2453546     3.75   0.000     .4380926   1.39987
      Diplopia1 |   .0395116   .4506416     0.09   0.930    -.8437314   .9227546
      _cons |   -8.28233   1.007949    -8.22   0.000    -10.25789   -6.306771
------------------------------------------------------------------------------
logit tabxneg0 age female1 newheadache taabnormality jawclaudication1 platelet crp
origesr discrao Diplopia1
Iteration 0:   log likelihood = -298.58568
Iteration 1:   log likelihood = -233.04312
Iteration 2:   log likelihood = -229.34022
```

```
Iteration 3:   log likelihood = -229.32973
Iteration 4:   log likelihood = -229.32973
Logistic regression                                 Number of obs      =       530
                                                    LR chi2(10)        =    138.51
                                                    Prob > chi2        =    0.0000
Log likelihood = -229.32973                         Pseudo R2          =    0.2319
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
           age |   .0465098   .0128504     3.62   0.000     .0213234   .0716961
      female1 |  -.2353227   .2571522    -0.92   0.360    -.7393318   .2686865
  newheadache |   .2044438   .2854474     0.72   0.474    -.3550228   .7639105
 taabnormality |   .4003271   .2554037     1.57   0.117     -.100255   .9009092
jawclaudication1 |   1.335526   .2592266     5.15   0.000    .8274508    1.843601
      platelet |   .0060248   .0010619     5.67   0.000     .0039435   .0081061
           crp |   .0028098   .0092628     0.30   0.762     -.015345   .0209645
      origesr |   .0089525   .0040991     2.18   0.029     .0009183   .0169866
      discrao |   .9951831   .2753072     3.61   0.000      .455591   1.534775
      Diplopia1 |  -.0639863   .5051335    -0.13   0.899    -1.05403   .9260571
      _cons |  -7.855003   1.121877    -7.00   0.000    -10.05384   -5.656165
```

(MULTIPLE IMPUTATION CHAINED EQUATIONS OF LOG TRANSFORMED DATA IS usually **NOT** RECOMMENDED BY , BUT INCLUDED IN APPENDIX FOR COMPLETENESS SAKE)

MICE of log transformed data is not usually recommended, but performed on the log transformed full model to examine for trends. There was no change in the significance of the predictor variables in the log transformed full model; multiple imputation estimate for the temporal artery abnormality predictor was not statistically significant ($p_{original}$ = .172, p_{MICE}=.065).

```
mi set wide
mi register imputed platelet lncrp lnesr newheadache taabnormality discrao Diplopia1
jawclaudication1
mi register regular tabxneg0 age female1
mi impute chained (regress) platelet (regress) lncrp (regress) lnesr (logit)
newheadache (logit)taabnormality (logit) discrao (logit) Diplopia1 (logit)
jawclaudication1 = tabxneg0 age female1, add(250) rseed(4409)
note: variables discrao Diplopia1 contain no soft missing (.) values; imputing nothing
Conditional models:
      newheadache: logit newheadache i.discrao i.Diplopia1 i.jawclaudication1
i.taabnormality lnesr platelet lncrp tabxneg0
                   age female1
      jawclaudicat~1: logit jawclaudication1 i.discrao i.Diplopia1 i.newheadache
i.taabnormality lnesr platelet lncrp tabxneg0
                   age female1
      taabnormality: logit taabnormality i.discrao i.Diplopia1 i.newheadache
i.jawclaudication1 lnesr platelet lncrp tabxneg0
```

```
                    age female1
              lnesr: regress lnesr i.discrao i.Diplopia1 i.newheadache
i.jawclaudication1 i.taabnormality platelet lncrp
                    tabxneg0 age female1
       platelet: regress platelet i.discrao i.Diplopia1 i.newheadache
i.jawclaudication1 i.taabnormality lnesr lncrp
                      tabxneg0 age female1
              lncrp: regress lncrp i.discrao i.Diplopia1 i.newheadache
i.jawclaudication1 i.taabnormality lnesr platelet
                    tabxneg0 age female1
Performing chained iterations ...
Multivariate imputation                     Imputations =     250
Chained equations                                 added =     250
Imputed: m=1 through m=100                      updated =         0
Initialization: monotone                     Iterations = 2500
                                             burn-in =     10
       platelet: linear regression
              lncrp: linear regression
              lnesr: linear regression
       newheadache: logistic regression
       taabnormality: logistic regression
       discrao: logistic regression
       Diplopia1: logistic regression
       jawclaudicat~1: logistic regression
------------------------------------------------------------------
                    |            Observations per m
                  |-----------------------------------------------
       Variable |   Complete   Incomplete   Imputed |       Total
------------------+-----------------------------------+----------
       platelet |          561          127    127 |       688
              lncrp |      559          129    129 |        688
              lnesr |      595          93     93 |         688
       newheadache |       686          2      2 |    688
       taabnormality |     679        9         9 |         688
       discrao |    688          0      0 |    688
       Diplopia1 |         688          0      0 |    688
       jawclaudicat~1 |          683          5      5 |    688
------------------------------------------------------------------
(complete + incomplete = total; imputed is the minimum across m
of the number of filled-in observations.)

mi estimate:  logit tabxneg0 age female1 newheadache taabnormality jawclaudication1
platelet lncrp lnesr discrao Diplopia1
Multiple-imputation estimates                   Imputations       =      250
Logistic regression                             Number of obs     =      688
                                                Average RVI       =      0.0895
                                                Largest FMI       =      0.2416
DF adjustment:   Large sample                   DF:     min       =   4,279.96
                                                        avg       = 176,897.51
                                                    max       = 765,589.65
```

```
Model F test:       Equal FMI                   F(  10,328159.3)  =        12.29
Within VCE type:          OIM                   Prob > F          =      0.0000
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
             age |   .0514132   .0117052     4.39   0.000    .0284713     .074355
      female1 |   .1148088   .2367164  0.49   0.628    -.3491502   .5787677
      newheadache |   .0739943   .2562119     0.29   0.773    -.4281759   .5761644
  taabnormality |   .4321508    .234619        1.84   0.065    -.0277023  .892004
jawclaudication1 |   1.344632   .2293685     5.86   0.000    .8950734     1.79419
      platelet |   .0047802   .0010181  4.70   0.000     .0027844   .0067761
      lncrp |   .3254603    .095798    3.40   0.001     .1376466  .513274
      lnesr |   .1723798   .1546375    1.11   0.265    -.1307628   .4755223
      discrao |   .9623211   .2515404  3.83   0.000     .4693082   1.455334
      Diplopia1 |  -.0911896   .4530914 -0.20   0.840    -.9792338  .7968546
      _cons |  -10.46421   1.454274    -7.20   0.000    -13.31468   -7.613738
------------------------------------------------------------------------------
logit tabxneg0 age female1 newheadache taabnormality jawclaudication1 platelet lncrp
lnesr discrao Diplopia1
Iteration 0:   log likelihood = -298.58568
Iteration 1:   log likelihood = -227.04763
Iteration 2:   log likelihood = -222.16089
Iteration 3:   log likelihood = -222.11488
Iteration 4:   log likelihood = -222.11486
Logistic regression                             Number of obs      =      530
                                                LR chi2(10)        =      152.94
                                                Prob > chi2        =      0.0000
Log likelihood = -222.11486                     Pseudo R2          =      0.2561
------------------------------------------------------------------------------
      tabxneg0 |   Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
             age |   .0449871   .0131698       3.42   0.001     .0191748   .0707993
      female1 |  -.1523934   .2610758  -0.58   0.559    -.6640926  .3593057
      newheadache |   .2306857   .2895042     0.80   0.426    -.3367321   .7981035
  taabnormality |   .3563223   .2609711        1.37   0.172    -.1551716   .8678162
jawclaudication1 |   1.296339   .2636562     4.92   0.000    .7795826    1.813096
      platelet |   .0050691   .0010637  4.77   0.000     .0029844   .0071538
      lncrp |   .2901259   .0980896    2.96   0.003     .0978738  .482378
      lnesr |   .1870691    .170521    1.10   0.273    -.1471459   .5212841
        discrao |    1.03084   .2806157       3.67   0.000  .4808433      1.580836
      Diplopia1 |   -.229284   .5020145 -0.46   0.648    -1.213214  .7546464
      _cons |   -9.96761   1.600932    -6.23   0.000    -13.10538 -6.82984
------------------------------------------------------------------------------
```

Multiple imputation analysis of the log transformed model: n=688, 250 imputations

Predictor	β	Odds ratio (O.R.)	p value	95% confidence interval (O.R.)	β Multiple imputation estimates	p Multiple imputation estimates

Age	0.045	1.046	0.001	1.019, 1.074	0.052	<.001
Gender (female)	-0.152	0.859	0.559	0.514, 1.432	0.114	0.628
New headache	0.231	1.259	0.426	0.714, 2.221	0.078	0.761
Jaw claudication	1.296	3.656	<0.001	2.181, 6.129	1.342	<0.001
TA abnormality	0.356	1.428	0.172	0.856, 2.382	0.430	0.067
Vision Loss	1.031	2.803	<0.001	1.617, 4.859	0.967	<0.001
Diplopia	-0.229	0.795	0.648	0.297, 2.127	-0.090	0.842
lnESR	0.187	1.206	0.273	0.863, 1.684	0.167	0.280
lnCRP	0.290	1.337	0.003	1.103, 1.620	0.331	0.001
Platelets	0.005	1.005	<0.001	1.003, 1.007	0.005	<0.001
Constant	-9.967				-10.450	

TA abnormality: temporal artery abnormality on clinical exam

lnESR: natural logarithm of ESR

lnCRP: natural logarithm CRP

BOOTSTRAP SAMPLING (3000 random samples) OF PARSIMONIOUS MODEL

```
logit tabxneg0 age jawclaudication1 platelet lncrp discrao, vce (bootstrap, reps(3000)
bca seed(1))
estat bootstrap
```

INTERNAL VALIDATION PARSIMONIOUS MODEL

```
cvAUROC tabxneg0 age jawclaudication1 platelet lncrp discrao, kfold(10) seed(3)
1-fold.............................
2-fold.............................
3-fold.............................
4-fold.............................
5-fold.............................
6-fold.............................
7-fold.............................
8-fold.............................
9-fold.............................
10-fold............................
(530 real changes made)
                    ROC                    -Asymptotic Normal--
       Obs     Area     Std. Err.         [95% Conf. Interval]
    -------------------------------------------------------------
       530     0.8102       0.0224        0.76634       0.85397
```

INTERNAL VALIDATION FULL MODEL

```
cvAUROC tabxneg0 female1 age newheadache taabnormality
jawclaudication1 platelet lnesr lncrp discrao, kfold(10) seed(1)
cvAUROC tabxneg0 female1 age newheadache taabnormality jawclaudication1 platelet lnesr
lncrp discrao Diplopia1, kfold(10) seed
> (2)
1-fold.............................
2-fold.............................
3-fold.............................
4-fold.............................
5-fold.............................
6-fold.............................
7-fold.............................
8-fold.............................
9-fold.............................
10-fold............................
(530 real changes made)
                    ROC                    -Asymptotic Normal--
      Obs     Area     Std. Err.         [95% Conf. Interval]
    -------------------------------------------------------------
      530    0.8030       0.0233        0.75726       0.84875
```

EXTERNAL VALIDATION further examples
Full model; Combined centers below
Full model: Toronto below
Full model: Swiss below
Parsimonious model: Combined centers, below

External Validation: Comparison with the development data of the distribution of important variables (demographics, predictors and outcome with ANOVA.

```
by code3, sort : tabstat Age female1 New_Headache TA_tender_noPulse Jaw_claudication
CRP Platelets Vision_Loss ESR Diplopia length, statistics( mean sd count )
Combined
  stats |       Age    female1  New_He~e  TA~Pulse  Jaw_cl~n       CRP  Platel~s
Vision~s           ESR  Diplopia length
---------+-------------------------------------------------------------------------
---------------------------------
      mean |  73.04762  .5873016  .7619048  .4761905  .3492063   5.18452  381.5079
.5079365  8.335137   .047619  1.973684
        sd |  10.24133  .4962739  .4293388  .5034444  .4805484  1.518077  139.7956
.5039526  .7852612  .2146694  .1147079
         N |         63       63       63       63       63       63       63
19
---------+-------------------------------------------------------------------------
---------------------------------
Kingston
  stats |       Age    female1  New_He~e  TA~Pulse  Jaw_cl~n       CRP  Platel~s
Vision~s       ESR  Diplopia     length
```

```
---------+-----------------------------------------------------------------------------
---------------------------------
      mean |  74.43605  .6686047       .75  .3953488  .2674419  5.307306  317.6105
.2325581  8.343498  .0930233  1.756977
      sd |  9.499245  .4720892   .434277   .490353  .4439171  1.657388  117.5335
.4236963   .868971  .2913131  .5978599
      N |       172       172    172       172       172    172       172       172
      172       172       172
---------------------------------------------------------------------------------------
---------------------------------
Ottawa
  stats |       Age   female1  New_He~e  TA~Pulse  Jaw_cl~n       CRP  Platel~s
Vision~s            ESR  Diplopia length
---------+-----------------------------------------------------------------------------
---------------------------------
      mean |  74.36219  .7058824  .7815126  .2016807   .210084  3.541939  315.0168
.2436975  7.546964  .0252101            2.5
      sd |  9.659166  .4575717  .4149671  .4029517  .4090905  1.534551  119.9266
.4311275  1.430981  .1574255            0
      N |       119       119    119       119       119    119       119       119
      119       119       119
Rochester_MN
  stats |       Age   female1  New_He~e  TA~Pulse  Jaw_cl~n       CRP  Platel~s
Vision~s            ESR  Diplopia length
---------+-----------------------------------------------------------------------------
---------------------------------
      mean |  74.21154  .6923077  .6923077  .1730769  .1538462  4.553688  279.5192
.1153846   8.10026  .0576923  1.317308
      sd |  10.15437  .4660414  .4660414  .3820047  .3643213  1.310443  94.99731
.3226025  1.139259  .2354355  .4869759
      N |          52     52     52     52     52     52     52     52     52     52
52
---------------------------------------------------------------------------------------
---------------------------------
Toronto
  stats |       Age   female1  New_He~e  TA~Pulse  Jaw_cl~n       CRP  Platel~s
Vision~s            ESR  Diplopia length
---------+-----------------------------------------------------------------------------
---------------------------------
      mean |  72.66935  .6935484  .6774194  .5080645  .2822581  4.312429  280.2742
.0967742     7.8404  .0241935  1.607917
      sd |  10.47701  .4628898  .4693602  .5019631  .4519242  1.621985  107.6076
.2968494  1.034101   .154273  .7713623
      N |       124       124    124       124       124       124       124    124
      124       124       120
---------------------------------------------------------------------------------------
---------------------------------
```

by tabxneg0, sort : tabstat Age female1 New_Headache TA_tender_noPulse Jaw_claudication CRP Platelets Vision_Loss ESR Diplopia length, statistics(mean sd count) by(code3)

Negative Biopsy Group

```
Summary statistics: mean, sd, N
 by categories of: code3
      code3 |      Age   female1  New_He~e  TA~Pulse  Jaw_cl~n       CRP  Platel~s
Vision~s            ESR  Diplopia length
--------------+------------------------------------------------------------------
-----------------------------------------
     Combined |  67.83333  .5416667  .6666667        .375  .1666667  4.714693
323.7083  .4166667  8.215517  .0833333  1.916667
              |  11.84563  .5089774  .4815434  .4945354  .3806935  1.613385  114.5727
.5036102  .8071274  .2823299  .2041241
              |      24        24        24     24     24     24     24     24     24
24            6
--------------+------------------------------------------------------------------
-----------------------------------------
     Kingston |  73.24286  .6928571  .7357143  .3785714  .1857143  5.104099  303.3857
.2142857  8.299645  .0928571  1.734286
              |  9.733035  .4629656  .4425354  .4867726  .3902723  1.644053  108.3706
.4117993  .8720117  .2912743  .6051067
              |      140       140       140       140       140    140       140
140           140       140       140
--------------+------------------------------------------------------------------
-----------------------------------------
      Ottawa |  73.23478   .673913  .7934783  .1630435   .173913  3.134447  282.3261
.2282609  7.308337  .0217391       2.5
              |  9.928618  .4713482  .4070274  .3714295  .3811116  1.322775  92.46765
.4220114   1.51303  .1466296            0
              |      92     92     92     92     92     92     92     92     92     92
92
--------------+------------------------------------------------------------------
-----------------------------------------
 Rochester_MN |  73.86842  .6842105  .7368421  .1578947  .0526316  4.329098     272.5
.1052632  7.989262  .0263158  1.307895
              |  10.50912  .4710691  .4462583   .369537  .2262943  1.257937  96.22321
.3110117  1.210942  .1622214   .469837
              |      38     38        38        38     38     38     38     38     38
38     38
--------------+------------------------------------------------------------------
-----------------------------------------
      Toronto |  72.67961  .6990291  .6699029  .4563107  .2427184  4.056551  266.9417
.0679612  7.726733  .0194175    1.6085
              |  10.95554   .460923  .4725473  .5005232  .4308227  1.628432  96.77626
.25291  1.071258  .1386618  .8055068
              |      103       103       103    103       103       103    103
103           103    103       100
--------------+------------------------------------------------------------------
-----------------------------------------
      Total |  72.82771  .6801008  .7279597  .3274559  .1838791  4.278151  287.3224
.1813602  7.886487  .0503778  1.848005
```

```
             |  10.34455  .4670258  .4455721  .4698773  .3878744  1.703687  102.1441
.3858025  1.189804  .2189994  .6952717
             |      397       397       397       397       397    397    397
397          397    397       376
-------------------------------------------------------------------------------------
---------------------------------------
```

Positive Biopsy Group

```
Summary statistics: mean, sd, N
 by categories of: code3
      code3 |       Age   female1  New_He~e  TA~Pulse  Jaw_cl~n    CRP  Platel~s
Vision~s            ESR  Diplopia    length
--------------+----------------------------------------------------------------------
---------------------------------------
      Combined |  76.25641  .6153846  .8205128  .5384615  .4615385  5.473644
417.0769  .5641026  8.408749   .025641         2
             |  7.645838  .4928641  .3887764  .5050354  .5050354  1.399769  143.2898
.5023561  .7727799  .1601282            0
             |      39     39     39     39     39     39     39     39     39     39
13
--------------+----------------------------------------------------------------------
---------------------------------------
      Kingston |  79.65625     .5625   .8125         .46875      .625  6.196337
379.8438     .3125  8.535355     .09375   1.85625
             |  6.198904  .5040161  .3965578  .5070073  .4918694  1.424984  136.4897
.4709291  .8420514  .2961446   .563364
             |      32     32     32     32     32     32     32     32     32     32
32
--------------+----------------------------------------------------------------------
---------------------------------------
      Ottawa |   78.2037  .8148148  .7407407  .3333333  .3333333  4.930431  426.4074
.2962963  8.360062   .037037       2.5
             |  7.654585  .3958474  .4465761  .4803845  .4803845  1.404883  136.6799
.4653216   .626882  .1924501            0
             |      27     27     27     27     27     27     27     27     27     27
27
--------------+----------------------------------------------------------------------
---------------------------------------
 Rochester_MN |  75.14286  .7142857  .5714286  .2142857  .4285714   5.16329  298.5714
.1428571   8.40154  .1428571  1.342857
             |  9.428738  .4688072  .5135526  .4258153  .5135526  1.298283  92.28527
.3631365  .8857189  .3631365  .5487248
             |      14     14     14     14     14     14     14     14     14     14
14
--------------+----------------------------------------------------------------------
---------------------------------------
      Toronto |  72.61905  .6666667  .7142857  .7619048  .4761905  5.567447  345.6667
.2380952   8.39791   .047619     1.605
             |  7.933954  .4830459      .46291  .4364358  .5117663   .815159  134.3244
.4364358  .5752944  .2182179  .5880163
```

```
             |      21     21     21     21     21     21     21     21     21     21
20
-------------+------------------------------------------------------------------------
-----------------------------------------
       Total |   76.7782  .6616541  .7593985   .481203  .4736842  5.519391  386.2632
.3533835  8.426856  .0601504  1.922642
             |  7.824779  .4749357  .4290648  .5015356  .5011947  1.375809  138.6938
.4798278  .7398071  .2386642  .5876966
             |      133       133       133    133       133       133    133
133          133    133       106
-------------------------------------------------------------------------------------
-----------------------------------------
```

foreach x of varlist age female1 newheadache taabnormality jawclaudication1 platelet origesr crp discrao Diplopia1 length {
oneway `x' code3, bonferroni
}
***

```
foreach x of varlist age female1 newheadache taabnormality jawclaudication1 platelet
origesr crp discrao  Diplopia1 length {
 2.
. oneway `x' code3, bonferroni
 3.
. }
                    Analysis of Variance
       Source              SS           df      MS          F      Prob > F
------------------------------------------------------------------------
Between groups      309.98749    4   77.4968724       0.79   0.5340
Within groups       51702.6105   525   98.4811628
------------------------------------------------------------------------
       Total        52012.598    529   98.3224914
Bartlett's test for equal variances:  chi2(4) =   1.7275  Prob>chi2 = 0.786
                     Comparison of AGE by code3
                                (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+----------------------------------------
Kingston |   1.38843
       |      1.000
       |
 Ottawa |    1.31457   -.073861
        |    1.000         1.000
       |
Roches.. |   1.16392   -.224508   -.150647
       |      1.000        1.000        1.000
       |
Toronto |   -.378264   -1.76669   -1.69283   -1.54218
       |      1.000        1.000        1.000      1.000
                    Analysis of Variance
       Source              SS           df      MS          F      Prob > F
```

```
------------------------------------------------------------------------------
Between groups      .66318155    4   .165795387      0.75   0.5560
Within groups       115.517951   525   .220034191
------------------------------------------------------------------------------
      Total         116.181132    529   .219624068
Bartlett's test for equal variances:  chi2(4) =   0.6108  Prob>chi2 = 0.962
                  Comparison of SEX(female) by code3
                                (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+--------------------------------------------
Kingston |   .081303
         |      1.000
         |
 Ottawa |    .118581       .037278
         |      1.000        1.000
         |
Roches.. |   .105006       .023703   -.013575
         |      1.000        1.000        1.000
         |
Toronto |    .106247       .024944   -.012334    .001241
         |      1.000        1.000        1.000      1.000
                  Analysis of Variance
      Source              SS           df      MS          F      Prob > F
------------------------------------------------------------------------------
Between groups      .847271494   4   .211817874      1.09   0.3615
Within groups       102.171596   525   .194612565
------------------------------------------------------------------------------
      Total         103.018868   529   .194742661
Bartlett's test for equal variances:  chi2(4) =   2.3152  Prob>chi2 = 0.678
                  Comparison of NEWHEADACHE by code3
                                (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+--------------------------------------------
Kingston |   -.011905
         |      1.000
         |
 Ottawa |    .019608       .031513
         |      1.000        1.000
         |
Roches.. |   -.069597   -.057692   -.089205
         |      1.000        1.000   1.000
         |
Toronto |   -.084485   -.072581   -.104093   -.014888
         |      1.000        1.000        0.665      1.000
                  Analysis of Variance
      Source              SS           df      MS          F      Prob > F
------------------------------------------------------------------------------
Between groups      8.56420742   4   2.14105185      9.82   0.0000
```

```
Within groups       114.424472   525   .217951375
-------------------------------------------------------------------------
      Total         122.988679   529   .232492777
Bartlett's test for equal variances:  chi2(4) =  11.1540  Prob>chi2 = 0.025
                    Comparison of taabnormal~y by code3
                                (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+---------------------------------------------
Kingston |   -.080842
         |      1.000
         |
 Ottawa  |    -.27451   -.193668
         |      0.002        0.005
         |
Roches.. |   -.303114   -.222272   -.028604
         |      0.006        0.028        1.000
         |
Toronto  |    .031874       .112716      .306384    .334988
         |      1.000        0.409        0.000      0.000
                    Analysis of Variance
      Source              SS           df      MS          F      Prob > F
-------------------------------------------------------------------------
Between groups      1.44865439   4   .362163596      1.91   0.1077
Within groups       99.6532324   525   .189815681
-------------------------------------------------------------------------
      Total         101.101887   529   .191118879
Bartlett's test for equal variances:  chi2(4) =   5.5112  Prob>chi2 = 0.239
                    Comparison of jawclaudic~1 by code3
                                (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+---------------------------------------------
Kingston |   -.081764
         |      1.000
         |
 Ottawa  |   -.139122   -.057358
         |      0.409        1.000
         |
Roches.. |   -.19536   -.113596   -.056238
         |      0.170        1.000        1.000
         |
Toronto  |   -.066948       .014816      .072174    .128412
         |      1.000        1.000        1.000      0.750
                    Analysis of Variance
      Source              SS           df      MS          F      Prob > F
-------------------------------------------------------------------------
Between groups      490529.653   4   122632.413      9.00   0.0000
Within groups       7155506.27   525   13629.5358
-------------------------------------------------------------------------
```

```
      Total        7646035.92   529   14453.7541
Bartlett's test for equal variances:  chi2(4) =  10.0430  Prob>chi2 = 0.040
                  Comparison of platelet by code3
                               (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+--------------------------------------------
Kingston |   -63.8975
       |      0.002
       |
 Ottawa |   -66.4911   -2.59366
       |      0.003        1.000
       |
Roches.. |   -101.989   -38.0912   -35.4976
       |      0.000        0.397        0.680
        |
Toronto |   -101.234   -37.3363   -34.7426    .754963
       |      0.000        0.069        0.208      1.000
                  Analysis of Variance
      Source              SS           df      MS          F      Prob > F
------------------------------------------------------------------------------
Between groups      56924.9564   4   14231.2391      15.10 0.0000
Within groups       494873.465   525   942.616123
------------------------------------------------------------------------------
      Total        551798.421   529    1043.0972
Bartlett's test for equal variances:  chi2(4) =  43.4064  Prob>chi2 = 0.000
                  Comparison of origesr by code3
                               (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+--------------------------------------------
Kingston |   3.82676
       |      1.000
       |
 Ottawa |   -21.4612   -25.2879
       |      0.000        0.000
       |
Roches.. |   -5.79117   -9.61793      15.67
       |      1.000        0.483        0.022
       |
Toronto |   -15.5368   -19.3636  5.92435   -9.74566
       |      0.011        0.000        1.000      0.552
                  Analysis of Variance
      Source              SS           df      MS          F      Prob > F
------------------------------------------------------------------------------
Between groups      11197.2915   4   2799.32288      17.29 0.0000
Within groups       85022.0439   525    161.94675
------------------------------------------------------------------------------
      Total        96219.3355   529   181.889103
Bartlett's test for equal variances:  chi2(4) = 174.8649  Prob>chi2 = 0.000
```

Comparison of **crp** by code3
(Bonferroni)

Row Mean-| Col Mean	Combined	Kingston	Ottawa	Roches..
Kingston	4.82371			
	0.103			
Ottawa	-6.68107	-11.5048		
	0.008	0.000		
Roches..	-4.13833	-8.96204	2.54274	
	0.832	0.000	1.000	
Toronto	-3.80594	-8.62966	2.87512	.332386
	0.538	0.000	0.789	1.000

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	7.75825082	4	1.9395627	12.05	0.0000
Within groups	84.5228813	525	.160995964		
Total	92.2811321	529	.174444484		

Bartlett's test for equal variances: chi2(4) = 32.3925 Prob>chi2 = 0.000

Comparison of **DiscRAO** by code3
(Bonferroni)

Row Mean-| Col Mean	Combined	Kingston	Ottawa	Roches..
Kingston	-.275378			
	0.000			
Ottawa	-.264239	.011139		
	0.000	1.000		
Roches..	-.392552	-.117174	-.128313	
	0.000	0.656	0.549	
Toronto	-.411162	-.135784	-.146923	-.01861
	0.000	0.042	0.045	1.000

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	.473271773	4	.118317943	2.38	0.0503
Within groups	26.0474829	525	.049614253		
Total	26.5207547	529	.050133752		

Bartlett's test for equal variances: chi2(4) = 79.0289 Prob>chi2 = 0.000

Comparison of Diplopia1 by code3
(Bonferroni)

```
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+--------------------------------------------
Kingston |   .045404
       |      1.000
       |
 Ottawa |   -.022409   -.067813
       |      1.000        0.110
       |
Roches.. |   .010073   -.035331    .032482
       |      1.000        1.000        1.000
       |
Toronto |   -.023425       -.06883   -.001017   -.033499
       |      1.000        0.090        1.000      1.000
                  Analysis of Variance
       Source              SS           df      MS          F      Prob > F
------------------------------------------------------------------------------
Between groups       73.7444151    4   18.4361038       60.96 0.0000
Within groups        144.25787     477    .302427401
------------------------------------------------------------------------------
       Total         218.002285    481    .453227204
Bartlett's test for equal variances:  chi2(3) =  61.1587  Prob>chi2 = 0.000
note: Bartlett's test performed on cells with positive variance:
       1 multiple-observation cells not used
                  Comparison of length by code3
                                (Bonferroni)
Row Mean-|
Col Mean |   Combined   Kingston     Ottawa   Roches..
---------+--------------------------------------------
Kingston |   -.216707
       |      1.000
       |
 Ottawa |    .526316       .743023
       |      0.001        0.000
       |
Roches.. |   -.656377   -.439669   -1.18269
       |      0.000        0.000        0.000
       |
Toronto |   -.365768       -.14906   -.892083    .290609
       |      0.073        0.231        0.000      0.016
foreach x of varlist age female1 newheadache taabnormality
jawclaudication1 platelet origesr crp discrao  Diplopia1 {
anova `x' code4
}
*
  Number of obs =          530    R-squared     =  0.0060
                           Root MSE      =    9.92377 Adj R-squared = -0.0016
             Source | Partial SS        df           MS     F    Prob>F
             -----------+----------------------------------------------------
```

```
 age   |  309.98749        4   77.496872       0.79  0.5340
             |
       code4 |  309.98749         4   77.496872       0.79  0.5340
             |
Residual |   51702.61      525   98.481163
-----------+-----------------------------------------------------
       Total |  52012.598         529   98.322491
             Number of obs =     530    R-squared     =  0.0057
             Root MSE      =    .469078 Adj R-squared = -0.0019
Source | Partial SS        df           MS     F    Prob>F
-----------+-----------------------------------------------------
       Sex   |  .66318155         4   .16579539       0.75  0.5560
             |
       code4 |  .66318155         4   .16579539       0.75  0.5560
             |
Residual |  115.51795      525   .22003419
-----------+-----------------------------------------------------
       Total |  116.18113         529   .21962407
             Number of obs =     530    R-squared     =  0.0082
             Root MSE      =    .441149 Adj R-squared =  0.0007
Source | Partial SS        df           MS     F    Prob>F
-----------+-----------------------------------------------------
       HA    |  .84727149         4   .21181787       1.09  0.3615
             |
       code4 |  .84727149         4   .21181787       1.09  0.3615
             |
Residual |   102.1716      525   .19461256
-----------+-----------------------------------------------------
       Total |  103.01887         529   .19474266
             Number of obs =     530    R-squared     =  0.0696
             Root MSE      =    .466853 Adj R-squared =  0.0625
Source | Partial SS        df           MS     F    Prob>F
-----------+-----------------------------------------------------
       TA    |  8.5642074         4   2.1410519       9.82  0.0000
             |
       code4 |  8.5642074         4   2.1410519       9.82  0.0000
             |
Residual |  114.42447      525   .21795137
-----------+-----------------------------------------------------
       Total |  122.98868         529   .23249278
             Number of obs =     530    R-squared     =  0.0143
             Root MSE      =    .435678 Adj R-squared =  0.0068
Source | Partial SS        df           MS     F    Prob>F
-----------+-----------------------------------------------------
       Claud |  1.4486544         4    .3621636       1.91  0.1077
            |
       code4 |  1.4486544         4    .3621636       1.91  0.1077
             |
Residual |  99.653232      525   .18981568
-----------+-----------------------------------------------------
```

```
       Total |  101.10189         529   .19111888
             Number of obs =     530    R-squared    =  0.0642
             Root MSE      =    116.746 Adj R-squared =  0.0570
Source | Partial SS       df           MS     F    Prob>F
-----------+-----------------------------------------------------
       Plat  |  490529.65         4   122632.41       9.00  0.0000
             |
       code4 |  490529.65         4   122632.41       9.00  0.0000
             |
Residual |  7155506.3      525   13629.536
-----------+-----------------------------------------------------
       Total |  7646035.9         529   14453.754
             Number of obs =     530    R-squared    =  0.1032
             Root MSE      =    30.7021 Adj R-squared =  0.0963
Source | Partial SS       df           MS     F    Prob>F
-----------+-----------------------------------------------------
       ESR   |  56924.956         4   14231.239       15.10  0.0000
             |
       code4 |  56924.956         4   14231.239       15.10  0.0000
             |
Residual |  494873.46      525   942.61612
-----------+-----------------------------------------------------
       Total |  551798.42         529   1043.0972
             Number of obs =     530    R-squared    =  0.1164
             Root MSE      =    12.7258 Adj R-squared =  0.1096
Source | Partial SS       df           MS     F    Prob>F
-----------+-----------------------------------------------------
       CRP |  11197.292          4   2799.3229       17.29  0.0000
           |
       code4 |  11197.292         4   2799.3229       17.29  0.0000
             |
Residual |  85022.044      525   161.94675
-----------+-----------------------------------------------------
     Total |  96219.335          529    181.8891
             Number of obs =     530    R-squared    =  0.0841
             Root MSE      =    .401243 Adj R-squared =  0.0771
Source | Partial SS       df           MS     F    Prob>F
-----------+-----------------------------------------------------
       Vision|  7.7582508         4   1.9395627       12.05  0.0000
             |
       code4 |  7.7582508         4   1.9395627       12.05  0.0000
             |
Residual |  84.522881      525   .16099596
-----------+-----------------------------------------------------
       Total |  92.281132         529   .17444448
             Number of obs =     530    R-squared    =  0.0178
             Root MSE      =    .222743 Adj R-squared =  0.0104
Source | Partial SS       df           MS     F    Prob>F
-----------+-----------------------------------------------------
Diplopia |  .47327177          4   .11831794       2.38  0.0503
```

```
                |
      code4 |  .47327177          4   .11831794      2.38  0.0503
                |
   Residual |  26.047483        525   .04961425
------------+------------------------------------------------------
      Total |  26.520755        529   .05013375
```

STATA NOMOGRAM

```
logit tabxneg0 CRP_divide_ULN Platelets Vision_Loss Jaw_claudication Age
nomolog, title(Nomogram:  Probability of Giant Cell Arteritis) varlblsize(2.8)
vli1(Vision_Loss,0,1,1,0)  vli4(Jaw_claudication,0,1,1,0) vli5(Age,40,100,10,0)
vli6(Platelets,50,950,75,0) vli9(CRP_divide_by_ULN,0,8.11,1,1) prlabsize(3.5)
```

CALIBRATION PLOT are visual representation of H-L statistic.

```
drop prob
drop probgroup
logit tabxneg0 age female1 newheadache taabnormality jawclaudication1 platelet lncrp
lnesr discrao Diplopia1
predict prob
egen probgroup=cut(prob), at(0(0.1)1)
tab probgroup tabxneg0
preserve
collapse (mean) tabxneg0, by(probgroup)
replace probgroup=probgroup + 0.05
scatter tabxneg0 probgroup || line probgroup probgroup, legend(order(1 "Observed" 2
"Predicted"))
1 newheadache taabnormality jawclaudication1 platelet lncrp lnesr discrao Diplopia1
lroc
predict xb1, xb
logit tabxneg0 age jawclaudication1 platelet lncrp discrao
lroc
predict xb2, xb
logistic tabxneg0 agecat esrcat newheadache taabnormality
lroc
predict xb3, xb
roccomp tabxneg0 xb1 xb2 xb3, graph summary
roccomp tabxneg0 xb1 xb2 xb3, graph summary
                          ROC                -Asymptotic Normal--
                 Obs     Area     Std. Err.        [95% Conf. Interval]
-------------------------------------------------------------------------
xb1              525    0.8174       0.0223       0.77377      0.86111
xb2              525    0.8142       0.0221       0.77080      0.85755
xb3              525     0.6339       0.0287      0.57753      0.69018
-------------------------------------------------------------------------
```

n=525 (in the ACR model 5 patients under the age of 50 years were excluded)

ACR = American College of Rheumatology Classification Criteria (non-histologic)

```
drop xb xb2 xb3 xb4 xb5
```

```
logistic tabxneg0 age
predict xb1, xb
logit tabxneg0 jawclaudication1
lroc
predict xb2, xb
logistic tabxneg0 discrao
lroc
predict xb3, xb
logistic tabxneg0 platelet
lroc
predict xb4, xb
logistic tabxneg0 lncrp
lroc
predict xb5, xb
roccomp tabxneg0 xb1 xb2 xb3 xb4 xb5, graph summary
```

Bootstrap Sensitivity Analysis: Full model

```
logistic tabxneg0 age female1 newheadache jawclaudication1 platelet lnesr lncrp discrao
Diplopia1
Logistic regression                                 Number of obs     =        526
                                                    LR chi2(9)        =     150.06
                                                    Prob > chi2       =     0.0000
Log likelihood =  -222.3942                         Pseudo R2         =     0.2523
------------------------------------------------------------------------------
       tabxneg0 | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
----------------+-------------------------------------------------------------
            age |   1.04388   .0136856     3.28   0.001     1.017398    1.071051
       female1 |   .8514999   .2223184    -0.62   0.538      .5104393   1.420447
   newheadache |   1.365738   .3870027     1.10   0.271      .7837297   2.379953
jawclaudication1 |   3.979413   1.027158     5.35   0.000    2.399433   6.599778
       platelet |   1.005126   .0010682     4.81   0.000     1.003034    1.007221
       lnesr |   1.173762   .2118964     0.89   0.375      .8239766   1.672035
       lncrp |   1.362775   .1355529     3.11   0.002      1.12139    1.65612
       discrao |   2.622504   .7265376     3.48   0.001       1.5237   4.513701
       Diplopia1 |   .7751479   .3885454    -0.51   0.611  .2902132      2.07039
       _cons |   .0000968   .0001336    -6.70   0.000     6.48e-06   .0014462
------------------------------------------------------------------------------
logistic tabxneg0 age female1 newheadache jawclaudication1 platelet lnesr lncrp discrao
Diplopia1, vce (bootstrap, reps(5000) bca seed(1))
                                                    Number of obs       =        526
                                                      Replications      =      5,000
                                                      Wald chi2(9)      =      90.23
                                                      Prob > chi2       =     0.0000
Log likelihood =  -222.3942                         Pseudo R2         =     0.2523
------------------------------------------------------------------------------
             |   Observed   Bootstrap                         Normal-based
       tabxneg0 | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
----------------+-------------------------------------------------------------
            age |   1.04388   .0135409     3.31   0.001     1.017675    1.07076
       female1 |   .8514999   .2350384    -0.58   0.560      .495711   1.462651
   newheadache |   1.365738   .4293089     0.99   0.321      .7375625   2.528924
jawclaudication1 |   3.979413   1.074401     5.12   0.000    2.344246   6.755147
       platelet |   1.005126   .0010727     4.79   0.000     1.003025    1.00723
       lnesr |   1.173762   .1960574     0.96   0.337      .8460601   1.628393
       lncrp |   1.362775   .1277916     3.30   0.001     1.133977    1.637736
```

```
       discrao |   2.622504   .7398522      3.42   0.001     1.508614    4.55884
       Diplopia1 |   .7751479   .4196151    -0.47   0.638 .2682866    2.239599
       _cons |   .0000968   .0001394 -6.42   0.000     5.77e-06   .0016263
------------------------------------------------------------------------------
```

Bootstrap Sensitivity Analysis: Parsimonious model

```
logistic tabxneg0 age jawclaudication1 platelet lncrp discrao
Logistic regression                             Number of obs     =        526
                                                LR chi2(5)        =     147.61
                                                Prob > chi2       =     0.0000
Log likelihood = -223.62022                     Pseudo R2         =     0.2481
------------------------------------------------------------------------------
       tabxneg0 | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
----------------+-------------------------------------------------------------
              age |   1.044307   .0135879     3.33   0.001     1.018012    1.071281
jawclaudication1 |   4.080527 1.03364      5.55   0.000     2.483694    6.704009
       platelet |    1.00508   .0010511     4.85   0.000     1.003022    1.007142
       lncrp |   1.430682   .1142496        4.48   0.000     1.223401    1.673082
       discrao |   2.487281   .6682512      3.39   0.001     1.469044    4.211288
       _cons |   .0002163   .0002437 -7.49   0.000     .0000238   .0019693
logistic tabxneg0 age jawclaudication1 platelet lncrp discrao, vce (bootstrap, reps(5000
Logistic regression                             Number of obs =        526
                                                Replications      =      5,000
                                                Wald chi2(5)      =      93.78
                                                Prob > chi2       =     0.0000
Log likelihood = -223.62022                     Pseudo R2         =     0.2481
------------------------------------------------------------------------------
             |   Observed   Bootstrap                         Normal-based
       tabxneg0 | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
----------------+-------------------------------------------------------------
              age |   1.044307   .0130375   3.47   0.001     1.019064    1.070175
jawclaudication1 |   4.080527   1.051293     5.46   0.000   2.462724    6.761094
       platelet |    1.00508    .001026     4.96   0.000     1.003071    1.007093
       lncrp |   1.430682   .1129918        4.53   0.000     1.225511    1.670202
       discrao |   2.487281   .6674884      3.40   0.001     1.469927    4.208757
       _cons |   .0002163   .0002465 -7.40   0.000     .0000232   .0020197
------------------------------------------------------------------------------
```

NOMOGRAM CONSIDERATIONS

In this paper, there is only a nomogram for the parsimonious model.

A nomogram of the full model is available for readers interested in the graphic visualization of the importance of all 10 variables.

lnCRP	CRP	lnESR	ESR
0.00112	0.025	0.00483	0.01
1.35187	0.096508	3.34377	0.281892
2.70262	0.372552	6.68271	7.94633
4.05337	1.438168	10.0217	224.001
5.40412	5.551787		
6.75487	21.43167		
8.10562	82.73315		

lnCRP = logCRP +3.69 and lnESR =logESR +4.61

The addition of constants was performed to avoid non-negative values, as the nomogram cannot otherwise be generated. The values are transformed back to ESR and CRP.