



# MUSC4103

5Xj UbWX`Gh X]Yg`]b`A i g]W< ]ghc fmiUbX`7 i `h fY`%

GYa YghYf`C bY` `##`&\$%



GWcc`cZH Y`5ftg`UbX`A YXJU` `#`I BGK ` `5ftg`UbX`GcWJU` `GWYbWg

7ci fgY`Cj Yfj JYk

`GHJZ7cbhJW`i8YhJ`g`



UbX#cf] c'i a Y'cZ`YUfb]b[ "5'ghi XYbhgYY\_]b[ 'Uddfcj U'hc'VY'UVgYbhZcf'a cfY'hUbcY'a cbh'a i ghUdd'm  
]b'k f]h]b[ 'hc'h\Y'8YUb'UbX'dfcj ]XY'U''cf[[ ]bU'cf'W'fh]ZYX'gi ddcfh]b[ 'XcW'a YbHh]cb"

: cf'a cfY']bZcfa Uhcb'UVci h'h\Y'U'hYbXUbW' 'dfc'hc'W'g' ]b'h\Y': UW' 'hmcZ5f'g'UbX'GcW]U'  
GWYbW'g. [\hdg.#k k "Uf'g"i b'gk "YXi "Ui #W ffYbh'ghi XYbhg#UWUXYa \]W\]bZcfa Uhcb#dfc'hc'W'gl \[ i \]XY' \]bYg#](#)

5WUXYa ]W]bZcfa Uhcb'

: cf'YggYbh]U'ghi XYbh]bZcfa Uhcb'fY'Uh]b[ 'hc.'fYei Yg'g'Zcf'YI h'bg]cb/fYj ]Yk'cZa Uf\_g/cVW dUh]cbU''\YU'h



ቅX] ]Xi U`UbX`gY`ZX]fYWYX`YUfb]b[ `]g`XYj Y`cdYX`VmYbWci fU[ ]b[ `ghi XYbfg`hc`gY`YWhiAY]f`ck b`YI Ua d`Yg  
Zcf`ghi Xm]b`hAY`g\cfhk f]h]b[ `hUg\_`UbX`U`gc`VmifYei ]f]b[ `hAYa`hc`XYj ]gY`hAY]f`ck b`a U`cf`dfc`YWh]b  
Wcbgi`hU]cb`k ]h`hAY`YWhi`fYf`

# 5ggYgga Ybh

9I WdhZcf'hY'jb'WUgg'ei ]n'U''Ugg][ ba Ybfg'UfY'fc'VY'gi Va ]hYX'fc'Hi fb]hb'cb'hY'Wci fgY'A ccX'Y'g]hY"  
CbW'mci '\Uj'Y'gi Va ]hYX'mci 'k ]''fYW'j Y'U'fYW']dh


GhUfhXUH. Bch5dd]WVY

@Yb[ h. ) \$\$'k cfXg Z`]b!WUgg'dfYgYbhU]cb'UbX'X]gW gg]cb

8YHJ]g. 'b'[ fci dg'cZ' 'ghi XYbHg'XYVUH' d'cg]h]cb'ghUfYa YbHg'Zca 'hY'Wci fgY'gWXYXi 'Y''9UW' ghi XYbh  
gdYU\_g'Zc'f' 'a ]bi hYg''Gh XYbHg'k ]''gi Va ]h'hY]f'gW]dhdf]cf'hc'WUggZ'U'cb[ 'k ]h'U'gi a a UfmcZ'hY'[ fci d'g  
dfcW'gg'cZdfYdUfU]cb'fD' '\$\$'k cfXg'UbX'Ub'Yj U'i U]cb'cZa Ya VYfg'W'cbf]Vi h]cbg'fD&\$\$'k cfXg'Gh XYbHg  
k ]''fYW]j Y'k f]hYb'UbX'j YfVU'ZYXVUW'Gh XYbHg'fYW]j Y'Ub'j]bX]j ]Xi U'a Uf\_"

5XX]h]cbU'XYHJ]g.

H\]g'hUg\_]bj c]j Yg'ghi XYbh'YX'dfYgYbhU]cbg'UbX'X]gW gg]cb"; fci dg'UbX'k YY\_g'UfY'Ugg][ bYX'j]b'WUgg"

GYY'A ccX'Y'Zc'f'XYHJ]g'cb'h\]g'UggYgga Ybh'

Hi fb]h]b'gYH]b[ . H\]g'Ugg][ ba Ybh]g'gi Va ]hYX'h'fci [ \ 'Hi fb]h]b'UbX'ghi XYbHg'Xc'bchgYY'Hi fb]h]b  
g]a ]'Uf]mfYdcfHg"

5ggYgga Ybh' . A U'c'f'dfc'YVh

GhUfhXUH. Bch5dd]WVY

@Yb[ h. &) \$\$'K cfXg

8YHJ]g. &) \$\$'k cfXg"Gh XYbHg'k ]''fYW]j Y'U'bi a Yf]W' [ fUXY'UbX'k f]hYb'ZYXVUW\_"

5XX]h]cbU'XYHJ]g.

GYY'A ccX'Y'Zc'f'XYHJ]g"

Hi fb]h]b'gYH]b[ . H\]g'Ugg][ ba Ybh]g'gi Va ]hYX'h'fci [ \ 'Hi fb]h]b'UbX'ghi XYbHg'W]b'gY'Hi fb]h]b'g]a ]'Uf]m  
fYdcfHg"

5ggYgga Ybh( . @]ghYb]b[ 'UbX'\_bck`YX[ Y'ei ]n

GhUfhXUH. '

@Yb[ h. ( ) 'a ]bi hYg'fYI Wi X]b[ '']ghYb]b[ 'h]a Yk

8YHJ]g. 'HYghXi fU]cb. ( ) 'a ]bi hYg'H\]g'g'hY'Z]bU'UggYgga YbhUg\_"Gh XYbhk ]''fYW]j Y'U'bi a Yf]W'  
[ fUXY'U'cb[ 'k ]h' 'a cXY'Ub'gk Yfg"

Hi fb]h]b'gYH]b[ . H\]g'j]g'bchU'Hi fb]h]b'Ugg][ ba Ybh

Gi Va ]gg]cb`cZ5ggYgga YbhHUg\_g

Gh XYbhg`UfY`YI dYW`X`hc`di h`h`Y`f`b`Ua`Yg`UbX`gh`XYbhbi`a`VYfg`cb`Yj`YfmdU[`Y`c`Z`h`Y`f`Ugg][`ba`Ybhg`"

Hi fb]h]b`Gi Va ]gg]cb

≠mci`YbWci`bhYf`U`dfcV`Ya`k`Yb`U`h`Ya`dh]b[`hc`gi`Va`]hmc`f`Ugg][`ba`Ybh`h`fci`[`h`Hi`fb]h]b`z`d`Y`UgY`h`Y`d`l`cb`Y`9I`h`fb`U`Gi`ddcfh`cb`-`,`)`''`'`%`cf`Ya`U`h`Ya`cb`[YI`h`fb`U`h`h`gi`ddcfh`i`bgk`"YXi`"Ui`"](#)Gi`ddcfh`l`ci`fg`UfY`,`.\$`\$Ua`-`%`\$`.\$`\$da`cb`k`YY`X`Umg`UbX`-`.\$`\$Ua`-`.)`.\$`\$da`cb`k`YY`YbXg`f1`\*)`X`Umg`U`m`Y`UfL`≠mci`UfY`i`b`UV`Y`hc`gi`Va`]hmc`f`Ugg][`ba`Ybh`Xi`Y`hc`U`Z`U`h`k`]h`Hi`fb]h]b`mci`a`Um`Udd`m`Z`f`Ub`YI`h`bg]cb`z`Vi`hmc`a`i`gh`f`Y`h]b`mci`f`h]W`Y`h`bi`a`VYf`Z`ca`9I`h`fb`U`Gi`ddcfh`f`U`cb[`k`]h`Ub`mc`h`Y`f`f`Y`j`Ub`h`X`c`W`a`Y`bh`g`L`hc`]b`W`i`X`Y`U`g`Y`j`]X`Y`b`W`hc`gi`ddcfh`mci`f`YI`h`bg]cb`Udd`]W`h]cb`≠mci`Ya`U`9I`h`fb`U`Gi`ddcfh`mci`k`]`Ui`h`ca`U`h]W`m`f`Y`W`j`Y`U`h]W`Y`h`bi`a`VYf`z`Vi`h]Z`mci`h`Y`d`l`cb`Y`mci`k`]`b`Y`Y`X`hc`gd`Y`W`Z`W`m`Ug`Z`f`cb`Y`"



f`G][ b]Z]W]b]h]m]U]Z]Y]W]h]m]c]i] f]d]Y]f]Z]c]f]a] U]b]W]W] ]b]U]g]g]Y]g]g]U]V]`]Y]`]k] c]f]\_]Z]V]Y]`]h]U]`]Z]c]f]a] U]`]Y]b]X]!]c]Z]g]Y]a] Y]g]h]Y]f]`]Y]I] U]a] ]b]U]h]c]b]Z]U] W]U]g]g]`]h]Y]g]h]Z]U]`]U]V]c]f]U]h]c]f]m]i]h]Y]g]h]Z]U]`]g]Y]a] ]b]U]f]d]f]Y]g]Y]b]h]U]h]c]b]`]c]f]U]b]m]i]c]h]Y]f]`]Z]c]f]a] `]c]Z]U]g]g]Y]g]g]a] Y]b]h]

: c]f]`]Z] f]h]Y]f]`]X]Y]h]U]`]g]`]b]`]f]Y]`]U]h]c]b]`]h]c]`]G]d]Y]W]U]`]7]c]b]g]X]Y]f]U]h]c]b]`]b]W]i] X]b]b] [ ``]K] \]Y]b]`]h]c]`]5]d]d]`]m]Z]``<]c]k]`]h]c]`]5]d]d]`]m]`]U]b]X] ``]G]i] d]d]c]f]h]b] [ ]8]c]W] a] Y]b]h]U]h]c]b]``]d]`]Y]U]g]Y]`]f]Y]Z]f]`]h]c]`]h]Y]`]G]d]Y]W]U]`]7]c]b]g]X]Y]f]U]h]c]b]`]k] Y]V]g]h]Y]`].`

[\\]h\]d\]g.\]#\]g\]h\] X\]Y\]b\]h\]i\] b\]g\]k\] "Y\]X\]i\] "U\]i\] #\]g\]d\]Y\]W\]U\]`\]!\]W\]c\]b\]g\]X\]Y\]f\]U\]h\]c\]b\]](#)

## 5 WUXYa ]W<c bYghmiUbX`D`U[ ]Uf]ga

D`U[ ]Uf]ga `]g`i g]b[ `hY`k cfXg`cf]XYUg`cZchYfg`UbX`dfYgYbh]b[ `hYa `Ug`mci f`ck b" `hWUb`hU\_Y`a Ubm  
Zcfa gž Zca `XY`]VYfUHy`WXYUh]b[ `hc`UWV]XYbU`miW`cdm]b[ `Zca `U`gci fW`k ]hci hUW\_bck `YX[ Ya YbH`

I BGK `[ fci dg`d`U[ ]Uf]ga `]bhc`hY`Zc`ck ]b[ `WUHy[ cf]Yg.

7cdm]b[ .`i g]b[ `hY`gUa Y`cf`j Yfmg]a ]Uf`k cfXg`hc`hY`cf][ ]bU`hYI hcf]XYU`k ]hci hUW\_bck `YX[ ]b[ `hY  
gci fW`cf`i g]b[ `ei ch]cb`a Uf\_g`H\]g`U`gc`Udd`Yg`hc`ja U[ YgžUfhUbX`XYg][ b`dfc`YWgžUg`k Y`Ug  
dfYgYbU]cbg`k \Yfy`gca YcbY`dfYgYbh]g`Ubc`hYf`g:]XYUg`cf`k cfXg`k ]hci hWYX]hY[ cf]Yg.

- VYhYf'a UbU[ Y'mci f'h]a Y
  - i bXYfgHUbX'mci f'f][ \hg'UbX'fYgdcbg]V']hYg'Ug'U'gh XYbhUhl BGK
  - VY'Uk UfY'cZd'U[ ]Uf]ga ž'Vc'dmf][ \hž' BGK 'Gh XYbh7cXY'cZ7cbXi WñUbX'5WwdfUV'Y'l gY'cZ  
I BGK '⇒H'F Ygci fWg'Dc`]Wñ
-

lghef]WU'  
'UbX'WcbHYI h U'  
Y'hAY'gWcdY

X  
]U

Y]X  
%

<p>K YY_'. :%&amp;'A UfVX !:% A UfVX</p>	<p>Hi hcf]U'</p>	<p>8]gW gg]cb`VUgYX`cb`k YY_`&amp;`YWfi fY`UbX`fYUX]b[ g"  H\]g`k YY_`k Y`XY`j Y`XYYd`m]b`hc`X]gW gg]cb`cZ`h Y  fYUX]b[ g`Zcf`h`Y`k YY_`&amp;`YWfi fY`"7 ca Y`dfYdUfYX  k ]h`bchYg`  5`gcZ`k Yfi`cf[ Ub]gY`[ fci dg`UbX`hcd]Wg`Zcf`gh XYbh  `YX`h hcf]U`g`Zca`k YY_`*"</p>
	<p>@YWfi fY</p>	<p>F YUX]b[ #bYfdYh]b[ `gWcfYg/gm]gh]W</p>





<p>K YY_%&amp;. '&amp;%A Um! '&amp;+ A Um</p>	<p>Hi hcf]U'</p>	<p>7 ci fgY'fYj ]Yk Bc'dUbY`g'h]g'k YY_žUg'k Y'fYj ]Yk 'hY'Wci fgY WcbhYbhUbX'dfYdUfY'Zcf'hY'ei ]n"</p>
<p>K YY_% . '&amp;, 'A Um! '' &gt;i bY</p>	<p>Hi hcf]U'</p>	<p>7 ci fgY'Gi a a UfmUbX'X]gW gg]cb'UbX'Z]bU'ei ]n BCH9. ': ]bU'ei ]n ]g'Xi f]b[ 'hY''YWhi fY''A U_Y gi fY'mci 'UfhYbX'UbX'UfY'cb'h]a Y° ; fci d'Ugg][ ba Ybh Gh XYbh'YX'dUbY'. 'VUgYX'cb'k YY_%%'YWhi fYž fYUX]b[ g'UbX'k ]XYf'fYgYUfW" H\]g']g'hY''Ugh[ fci d'h hcf]U''fUbX'5XUa fğ Z]j ci f]hY hcd]W! 'd'YUgY'gi ddcfhmci f'dYYfg'Vmia U_]b[ 'gi fY mci 'Wca Y°</p>



F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

F YWca a YbXYX`F Ygci fWg

7ci fgY`9j U`i Uh]cb`UbX`8Yj Y`cda Ybh

Gh XYbhZYXVUW`]g`\_YYb`mfYei YghYX`hc`U`ck`Z`f`h`Yf`Z]bY!h`b]b[ `UbX`ja`dfcj`Ya`Ybhtg`]b`Z`h`fY`mYUfg`  
: cfa U`a`m9l`dYf]YbW`Yj`U`i`Uh]cbg`k`]`VY`i`gYX`Uh`h`Y`YbX`cZgYa`YghYf`Vi`hgh`XYbhtg`UfY`YbWci`fU[`YX`hc`  
dfcj`]XY`ZYXVUW`\_h`fci`[` \`ci`h`h`Y`gYa`YghYf`cb`Wci`fgY`WcbhYbhUbX`Ugg][`ba`Ybhtg`Ug`k`Y`Ug`h`Y`dUW]b[ `cZ`  
h`Y`Wci`fgYzY]h`Yf`ZUW`hc`ZUW`cf`hc`U`li`VYfh4`i`bgk`"YXi`"Ui`"5`ZYXVUW`k`]`VY`X]gW`ggYX`Ua`cb[ `a`i`g]W`  
ghUZZ`UbX`h`Y`Y`W`h`fYf`UbX`h`hc`ffg]k`]`k`cf`\_`WcgY`mhc`a`cb]hc`f`gh`XYbhdfc[`fYgg`UbX`YUfb]b[ `bYXg`  
7ci`fgY`WcbhYbhza`cXY`cZY`j`YfmUbX`Ugg][`ba`YbhgWXYXi`Y`a`UmU`VY`UX`ghYX`]b`Z`h`fY`mYUfg`Z]hWJb`  
VY`YghUV`]g`YX`h`Uhgi`W`W`Ub[`Yg`k`ci`X`Z`ghYf`XYdYf`YUfb]b[ `UbX`VYhYf`ci`h`Wca`Y`Z`f`gh`XYbhtg`"

⇒ U[ Y`7 fYX]h

>Ub`J`Yfa`YYff]Z]a`ci`g`dU]b]b[ `@UXmGHUbX]b[ `UhU`J`]f[ `]bU`g`ck`g`U`W`UfUW]f]gh]WdfUW]W`cZ`]g`h]a`Yz`  
k`]h`h`Y`]bghfi`a`Ybha`ci`bhYX`cb`U`hUV`Y`UbX`h`Y`d`UmYf`ghUbX]b[ "

fl`]Y.`>c`UbbYg`J`Yfa`YYf!`@UXmGHUbX]b[ `UhU`J`]f[ `]bU`"d[ `"]`[]`[\_`W[S`5a`\_`\_`a`et`fZWXdW]W`\_`W[S`  
d]bae]fackL

7F ⇒ CG

7F ⇒ CG`Dfcj`]XYf`7`cXY`.\$\$\$`-`,`;