



Objectives

! "#\$%&#&' (#)*#\$%+,#- .&, &' \$/\$+) ' 0#/\$\$&' (&&,# 1+22#3&#/32&#)\$#(+**&.&' \$+/\$&#,\$/ ' (/.(# , \$&.' /2#-.&4/5\$+) ', #*.) 6#6) (+*+&(#, \$&.' /2#-.&4/5\$+) ',

! "#\$%&#&' (#)*#\$%+,#- .&, &' \$/\$+) ' 0#/\$\$&' (&&,# 1+22#5' (&., \$/ ' (#%&' &*+\$, #)*# 6) (+*+&(#, \$&.' /2#-.&4/5\$+) ', #) '#+ 6 -.) 7+' 8#.&4) 7&."#, \$/\$5, #-), \$# 6 &(+/ '# , \$&.')\$) 6 "



Background

9 / . (+ / 4 # , 5 . 8 & . " # 5 \$ + 2 + : + ' 8 # \$ % & # 6 & (+ / ' #

Background

"#\$%&\$'&("#)'%\$(+'),\$-#./%0(1" "+2!"#

6 @/'*.A".\$7' : /&)"8#\$'A.9)"/"\$)\$'+/--%(

6 @/'&)#,8.\$7'?)8.\$%"8)'?#,5

6 @/'+- (8.\$7' /&'+-**.\$7'"8&/ -78'"8)'#& : (

6 B&/8.?' '&)#,8.\$7' /9)&8)#%'CD'EF'%)7&))(G'

4."8'/\$)' /&'?/"8'#& : (

6 @/'%&.9.\$7

!"#\$%\$'&' (&*)(\$%' +%,+)-,./%0\$'&' (\$"%

6 <+*H"8)'(# :)&)"&.,./\$(A/&'##*' +#.)\$"('

; @)7#"9)'. : +#, "/\$'A-\$, "/\$#*' : /?.*.H'#\$%'&), /9)&H

6 I\$,&#()%" :)"/'&)"-&\$"/'A-\$, "/\$#*' #, ".9.)(('

6 J)#&' /A'#, ".9."H'

— — —

Methods

!

- = >53 ; &(
- = 9?@ABC
- = <4+&'4&D+.&4\$
- = A>EA#F !<9G%),\$

!

- = B56 / '#,53H&4\$,
- = >&&#.&7+&1 &(
- = F'82+,%#2/ '85/8&



Search Terms

!

Inclusion Criteria

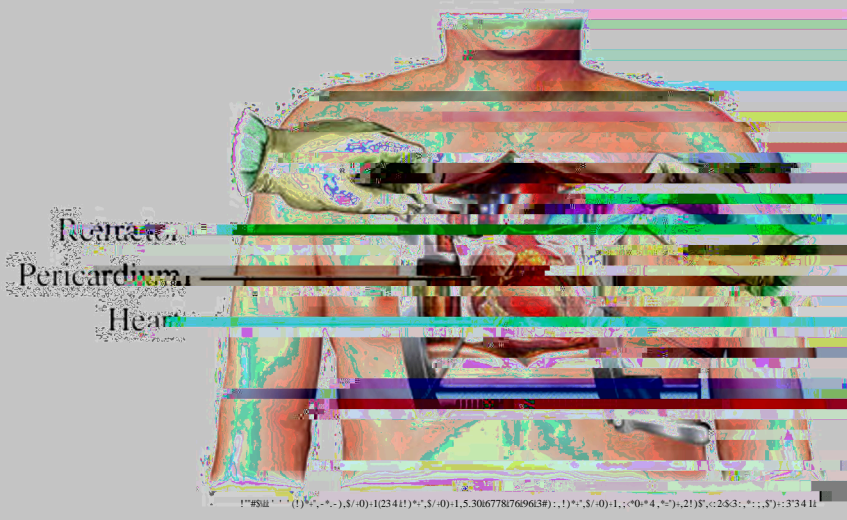
!

= IJ#"&/.,#).#)2(&.

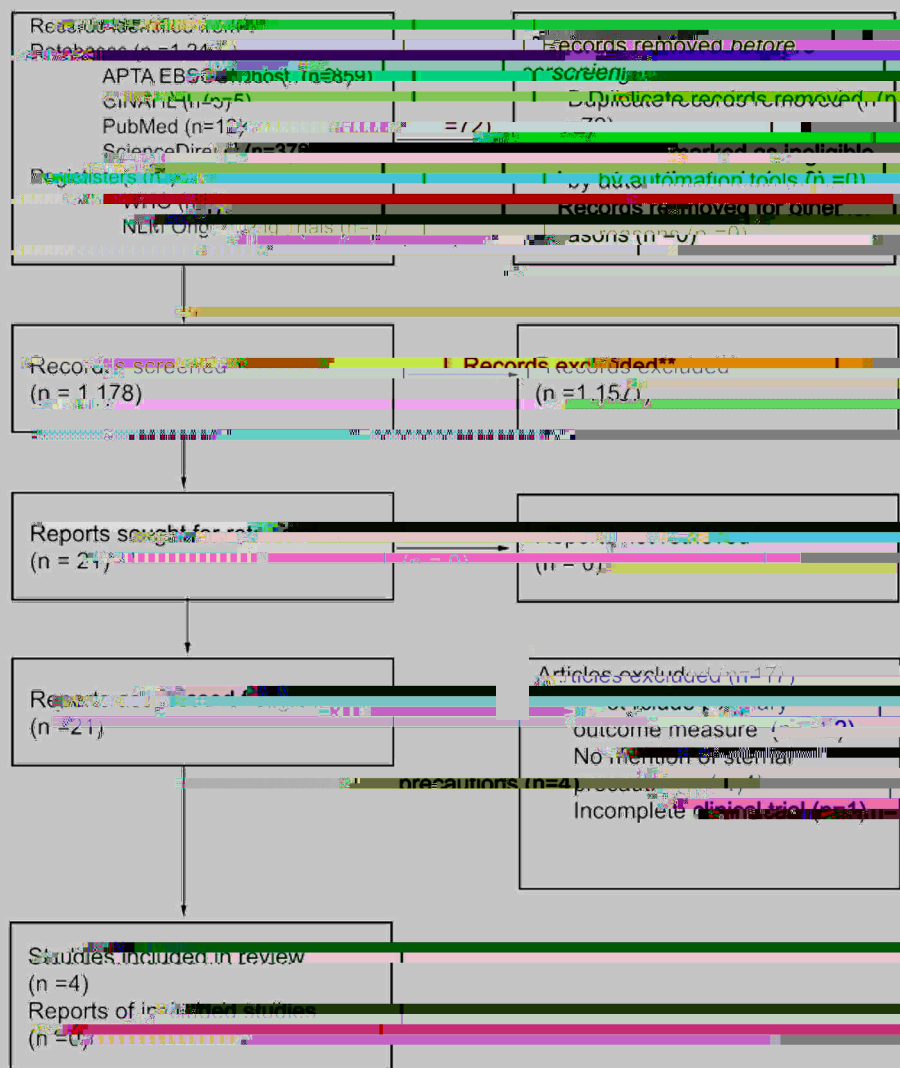
!

!

!



PRISMA



Oxford Levels of Evidence

! "#\$%&'(!) #*+ ,	- ' , ' . "%* (/ ' #*+ 0	1 2 3 + " 0 (4 ' 5 ' & (!
! "#\$%&' () (#) " * + ^	, - .	/ (0 (*) 1
2 " 3 4) (#) " * +	5 6 7 8 9 (: ; < # " *) = (7 \$ > <	/ (0 (*) 1
? " @ &) (#) " * +	A ' 7 (3 0 " # \$ B < " *	/ (0 (*) 1
C B * B D " E) (#) " * +	- 3 B 7 7 8 7 (@ # \$ B < " *) = (7 \$ > <	/ (0 (*) 1



Results



Results



Results: Significant Improvements

!"#\$%&'(!)#*+,, 6'7(8\$90\$9:,(

2"34)(#)"*+	<p>Q><#H0C<#L)BB(3)CL5)=7" '\$*\$#E)\$<=(9)J:^S+SSRK) a)\$<=\$@"#(7)>3("#(3)3(#63<)#B) H6<@#B<07)7#"<="3=)7#(3<"*) : 3(@"6#B<7)>3B6: ` G\$><\$H\$@"<#)=(@3("7()\$<)'B#&): "\$<)B0(3"**)HB3)'B#&)GG2)"<=)! b P X . .)>3B6:7)J:^S+SSRK F c B)=\$HH(3(<@() '(#D((<)GG2)07)! b P X . .): "\$<)7@B3(7)J:]S+V1UK</p>
?"@&)(#)"*+	<p>` P B3(): "#\$(<#7)=\$7@&"3>(=)&B ; ()D\$#&)! b P X . .))J:^S+SSRK) a)*(77)=d@)#B)\$<:"#\$(<#) 3(&" '\$*\$#"#B<)B3)74\$** (=)<637\$<> ` L@&\$\$(0(=)e\$<=(: (<=(<#f)B3)e ; B=\$H\$(=)\$<=(: (<=(<#f)H6<@#B<")*7#"#67)B<)' (=) ; B '\$*\$#E)B3) #3"<7H(37)'E)H\$<"*)2.)7(77\$B<)\$<)! b P X . .)J:^S+SSRK ` ! b P X . .)=\$7@B<#\$<6(=)2.) '(HB3(=)d@))J:^S+SSRK</p>

Results: No Statistically Significant Differences

! "#\$%&'(!) #*+ ", 6 '7(8\$90\$9:.,(

! "#\$%&'&' (#) #*+4

- ˘ c B)7\$><\$H\$@"<#)=\$HH(3(<@() '(#D((<)* (77)B3) ; B=\$H\$ (=)7#(3<"*): 3(@ "6#\$B<7)07+)@B<7(30"# \$0() : 3(@ "6#\$B<7)>3B6: 7)HB3)"**)B6#@B ; () ; ("763(7
- ˘ c B)7\$><\$H\$@"<#)=\$HH(3(<@ (7)\$<)G22 I)7@B3(70
 F N)D((47): B7#8B: 0) P Q)R+S): B\$<#T)UVWT) - X8S+1)#B)1+Y
 F R1)D((47): B7#8B: 0) P Q)S+N): B\$<#T)UVWT) - X)8S+U)#B)R+[
- ˘ / (77)3(7#3\$@#\$0()7#(3<"*): 3(@ "6#\$B<7)HB3)"=6*#7)"H#(3)@"3=\$" @)763>(3E)&"=)7\$; \$*"3)3(76*#70
 F 2&E7\$@"*)3(@B0(3ET): "\$<T)& ("*#&)3(*"# (=)5 A /
- ˘ c B)\$<@3("7()\$<)7#(3<"*)@B ; :*\$@"#\$B<7)<B#(=)D\$#&)#&()67()BH) ; B=\$H\$ (=)7#(3<"*): 3(@ "6#\$B<7

CB**BD"E)(#) #*+

- ˘ c B)7\$><\$H\$@"<#)=\$HH(3(<@ (7)' (#D((<) ! b P X . .)07)@B<7(30"# \$0() : 3(@ "6#\$B<7)>3B6: 7)HB3)"**)B6#@B ; () ; ("763(7
 F / (77)3(7#3\$@#\$0()>3B6:)&"=)* (77)=\$H\$@6*#E)D\$#&)H6<@#\$B<"*); B '\$*#E)#&"<)7#"<="3=
 : 3(@ "6#\$B<7)>3B6:)J:]+RNK
 F G(*H8@"3()#"747)J<B#)H63#&(3)=(H\$<(=K)J:]+Rg [K

Conclusions

Limitations

! ! "#\$%&'()*+,\$- *"'.'-),+- / %' / %"0)#%0

! 1).,\$2.%'0,%#*"'.'2#%+"),,\$- *'2#-,-+- .0

! 3"+4'-('#%.\$"5\$.\$.6'-('()*+,\$- *"'.'-),+- / %0'



Future Research

Clinical Relevance



&"'



(



!)#



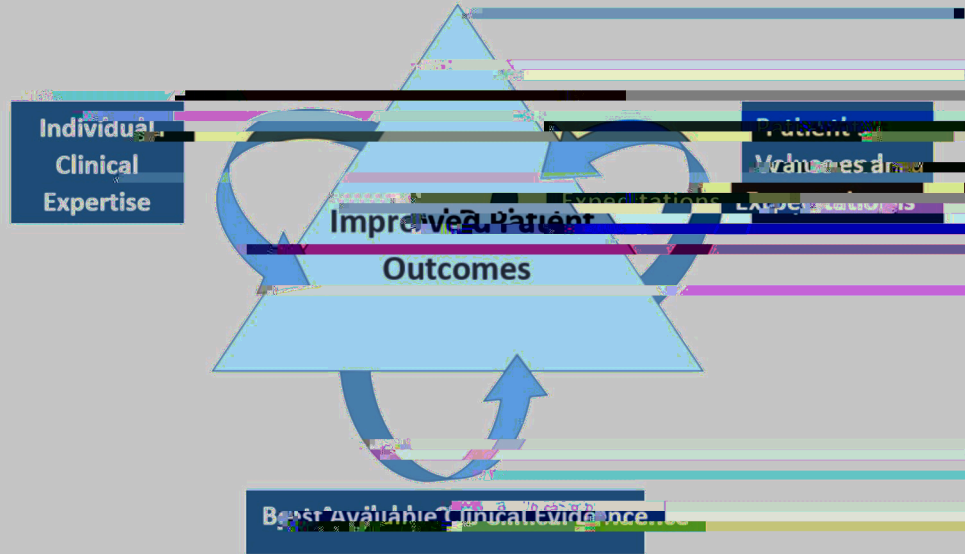
!)#

F M6<@#\$B<"*)B6#@B ; (7

F A:#\$; \$h()=\$7@&"'3>()=(7#\$<"#\$B<



Take Home Message



!""#Slll' ' ' ()+#!,+~! (. \$ ' (/01(+2l*3+*. /l.#4#5,+3. /5 6072-,8&l*7. .).54+\$,75#3+)"',5\$(!*"6-

Acknowledgments

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!

!

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References

!k '()(*+,-./0-.(/+12-340-5)(6-74k-5812,(*-921:(;8+<,>+<+<+8-8+?1-@<2-:)(,A1B-921:(;8+<,>=<C12=>=<21=82+<8+<,>=<"(-21C+16-<@-*+812(8;21-(,D-
21:<? ?1,D(8+<,>=<@<2-21C+<+<,>k-! "#\$%&'()*+,-./+0-I#<2k-\$E! !F\$\$G!H>I"!Ik
\$k JD(?=<K0-.<8=)(6-J0-LM;?<L0-18-(*k-J,-(*812,(8+C1-(992<(:)-8<-921=:2+N+,A=-812,(*-921:(;8+<,>=<@812-?1D+(,-=812,<8<?00-PQ119-0<;2-?<C1+,-
8)1-8;N1P<,+45".)+67%8+9I\$+!17:;<k-\$E!RF\$\$G!H>S#!EE<-D<+>!E!ETEUESSST\$TEk\$E!Rk!!S\$\$%#S
%k L*"J,=(20-70-.(/+12-340-JD(?=<K0-18-(*k-J,-1C+D1,:1"



Questions?





Functional Outcomes

— — —

```
< =>(/&,.(>)?%3%' /.@):% "$@)/A%",),"(.)$%(9)
< B":A.,)(/&,.( )" '+.-.' '+.' '$)-.,*&,#%' /.)
<
```

Functional Outcomes



%***

- + X<=(: (<=(<#0)<B)&(*: (3)B3)=(O\$(T)#\$; (*E)"<=)7"H()
- + P B=\$H\$(=)\$<=(: (<=(<#0)<B)&(*: (3T)<((=7)=(O\$@()B3)#"4(7)*B<>(3)#&"<)<B3 ; (*B3)@B<@(3<)HB3)7"H(#E)
- + G6: (30\$7\$B<0)<((=7)O(3' '*)@6(7T)76: (30\$7\$B<)B3)7(#)6:)
- + P \$<\$; "*"77\$7#"<@():"#\$(<#): (3HB3 ; 7)j VW)B3) ; B3()BH#"74)3(_6\$3\$<>)B<*E)7#("=E\$<>)"77\$7#"<@()
- + P B=(3"#()77\$7#"<@():"#\$(<#): (3HB3 ; 7)VS8j NW)BH)"@#\$O\$#E)
- + P "9\$; 6 ;)"77\$7#"<@():"#\$(<#): (3HB3 ; 7)1V8NUW)BH)"@#\$O\$#E)
- + . B#"*"77\$7#"<@():"#\$(<#): (3HB3 ; 7)S81NW)BH)"@#\$O\$#E)"<=d)B3)#&()&(*:)BH)#DB): (B: *())<3(_6\$3(=)



#

- + 5 6(7#\$B<<"\$3()=(O(*B: (=) 'E)@\$<\$@"*)7#"HH)
- + c B#)H63#&(3)=(H\$<(=)

