

! "#\$%&'()*+,*-
 . / 0&%\$(12&34 / *5&&\$#+*(&56(&'\$*"5&\$#+*(%1 / / 35#%&\$#15(15\$7*(83&'#\$9:12:#2*(12(#56#+#63&';(, #7(& / 91\$"107#%(
 '&\$*"&'(;%*"1;#;(

!

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

!

A)7+! 0&7(70\$.! &*97*B! *C\$#75*+! B)*()&! ()*! '+*! ;<! \$.(* & 5 \$(7 9 * ! \$ 5 6 ! \$ ' D # * 5 (\$ 7 9 * !
 0 ; # # ' 5 7 0 \$ (7 ; 5 ! 1 E E % 4 !) \$ + ! \$ 5 ! 7 # F \$ 0 (! ; 5 ! () * ! G ' \$. 7 (: ! ; < ! . 7 < * ! ; < ! 7 5 6 7 9 7 6 ' \$. + ! B 7 () ! \$ # : ; (& ; F) 7 0 !
 . \$ (* & \$. ! + 0 . * & ; + 7 + ! 1 E 2 / 4 ! E ! . 7 (* & \$ (' & * ! + * \$ & 0) ! ; < ! 0 ; # F ' (* & 7 H * 6 ! 6 \$ (\$ I \$ + * + ! & * + ' . (* 6 ! 7 5 ! + 7 C ! \$ & (7 0 . * + !
 # * * (7 5 D ! 7 5 0 . ' + 7 ; 5 ! 0 & 7 (* & 7 \$ - ! % & 7 (7 0 \$. ! \$ F F & \$ 7 + \$. ! ; < ! () * ! \$ & (7 0 . * + ! B \$ + ! 0 ; # F . * (* 6 ! I : ! (\$ J 7 5 D ! 7 5 (; !
 \$ 0 0 ; ' 5 (! + (' 6 : ! 6 * + 7 D 5 K ! # * () ; 6 ; . ; D : K ! ; ' (0 ; # * ! # * \$ + ' & * + K ! \$ 5 6 ! + (\$ (7 + (7 0 \$. ! * 9 7 6 * 5 0 * - ! > 9 * & \$. K !
 0 ' & & * 5 (! & * + * \$ & 0) !) \$ + ! < ; ' 5 6 ! () \$ (! E E % ! 7 5 (* & 9 * 5 (7 ; 5 + ! 7 # F & ; 9 * ! ; & ! \$ (! . * \$ + (! # 7 (7 D \$ (* ! () * 1 0) \$ 5 D * + ! 7 5 !
 G ' \$. 7 (: L ; < L . 7 < * ! ; < ! 7 5 6 7 9 7 6 ' \$. + ! B 7 () ! E 2 / - ! M 5 ! \$ 6 6 7 (7 ; 5 K ! * 9 7 6 * 5 0 * !) \$ + ! I * * 5 ! < ; ' 5 6 ! () \$ (! G ' \$. 7 (: L ; < L

Results

Londral et al. (2015) conducted a mixed-design randomized clinical trial to measure the effect of early intervention with an assistive communication device on the quality-of-life of ALS patients and their caregivers. Participants in the study included twenty-seven patients with bulbar-onset ALS (a form of the disease that impacts speech and swallowing first) and seventeen of their caregivers. Participants were randomized into two groups. The early intervention group received a tablet AAC device after baseline assessment, whereas the late intervention group received an AAC device according to protocols set by the center (when dysarthria scores reached 0 or 1 on the ALS Functional Rating Scale-revised (ALSFRRS-R)). Patient outcomes w*! #*\$+'&*6! '+75D! ()*! , 0P7..! Q'\$\$.7(! ;<! 27<*! G'*(7;55\$7&*! 1, Q;24! ()*! E2/RS/LS! \$56! ()*

0; # # ' 570\$(7;5! 6*970*! \$+!7(!&*.S(*+!(;!() *7&! G '\$.7(:L;<L
.7<*!\$56!67+\$I7.7(:-!!

!

3\$&(707F\$5(+! +*.<L&\$(*6! () *! ' +*! ;<! \$! 0; # # ' 570\$(7;5!
6*970*! \$+!) \$975D! \$! +(;&;5D*&! 7#F\$0(! ;5!() *7&! G '\$.7(:! ;<!
.7<*!\$+!0; #F\$&*6!(; !+F**0)!() *&\$F:-!] ;!67<<*&*50*+!B*&*!
<; ' 56! 75! 6*F&*+7;5! 1U@M4! \$56! G '\$.7(:! ;<! .7<*! 1/RLNZ4!
I*(B**5!() ;+*! B) ;! ' +*6! \$! 0; # # ' 570\$(7;5! 6*970*! \$56!
() ;+*! B) ;! &*0*79*6! +F**0)!() *&\$F:-! ;5.-! T ;B*9*&&!
() &; 'D)! # '.(7F.*!&*D&*+7;5! \$5\$. :+7+k!&*+*\$&0)*&+!<; ' 56!
() \$(! I '.I\$&! 7#F\$7&#*5(k! \$+! #*\$+ ' &*6! I :! E2/RS/LS!
+0;&*+k!) \$6! \$5! 756*F*56*5(! *<<*0(! ;5! G '\$.7(:! ;<! .7<*! \$56!
; ; 6-! ! R ' &() *&! \$5\$. :+7+! 7+! &*G ' 7&*6! (;! 6*(*& #75*! () *!
7#F\$0(! ;<! \$! 0; # # ' 570\$(7;5! 6*970*! B) 7.*! 0; 5(&; ..75D!<; &!
I '.I\$&! 7#F\$7&#*5(-!

!

=-0).-\$)* /#* -0!* 234597* 0;56'0(*6! \$! +'&9*:*! +'6:!(;!
 #*\$+'&*!()!*<<*0(!;<!)7D)L(*0)!*:*L(&\$0J75D!6*970*!*;5!
 ()!*G'\$.7(:!;<!.7<*!*;<!7567976'\$.+!B7()!E2/-!A)7&(:L<79*!
 7567976'\$.+! B7()! E2/! B);! '+*6! \$5! *:*L(&\$0J75D!
 0;# #'570\$(7;5! 6*970*! F\$&(707F\$(6! 75! ()!*! +'6:!* 97\$!
 G'*(7;55\$7&*+!A)&*!*G'*(7;55\$7&*+!B*&*!\$6#757+(*&*6?!
 W4!A)*!3+:0);+;07\$!.!M#F\$0(!;<!E++7+(79*!@*970*+!/0\$.*+!
 13ME@/4[! b4! A)*! Q'*I*0! 8+*&! "9\$. '\$(7;5! ;<
 /\$(7+<\$0(7;5! B7()! E++7+(79*! A*0)5;.;D:!*1Q8"/A! b_4[!
 \$56!N4!A)*!M567976'\$.:!*3&7;&7(7H*6!3&;I.*#!E++*+*#*5(!
 1M33E4! +0\$.*! B)70)! B\$+! \$6#757+(*&*6! '56*&! ()&*!
 0;567(7;5+?! B7()! \$5! *:*L(&\$0J75D! 6*970*! B7()! \$5! *:*L
 (&\$5+<*&! I ;&&6!

\$.-k!b_Wc4!T;B*9*&k!75!7567976'\$.+!B7(!E2/!k!WdX!)\$9*!
I**5!<;'56!(;!)\$9*!0;L#;&I76!6*#*5(7\$!\$56!;9*!d_X!
)\$9*! I**5! <;'56! (;!)\$9*! \$++;07\$(*6! 0;D57(79*!
7#F\$7&#*5(! 13)'J\$5! *(! \$.-k! b_WW4! P79*5! ()*!)7D)!
F&*9\$.*50*!;<0;D57(79*!7++ '*+k!&*+'.(+!<&;#!()*+*!+('67*+!
0\$55;(! I*! D*5*&\$7H*6! (;! 7567976'\$.+! B7(! E2/! \$+! \$!
B);*k!;5.:(;!7567976'\$.+!B7(!E2/!B);!6;!5;(!+);B!
\$5:! 0;D57(79*! 7#F\$7&#*5(-! ! , \$5:! F\$(7*5(+! B7(! E2/!
B);!&*a*0(! '+*!;<!EE%!\$.+;!+'<<*!<&;#!<&;5;(*#F;&\$!
6*#*5(7\$!1275+*!*(!\$.-k!b_WV4!A)*&<;&*k!()*+*!F\$(7*5(+!
#\$.!5;(!*CF*&7*50*!7#F&;9*6!G'\$.7(:L;<L.7<*!\$+!\$!&*+'.(!
;<!\$5!EE%!6*970*!-!
!

=%''(0';)%''*
!

2;56&\$.\$! E-K! 375(;K! E-K! 375(;K! /-K! EH*9*6;K! 2-K! g! @*! !
 %\$&9\$.);K! , -! 1b_W04-! Q'\$.7(:! ;<! .7<*! 75! 3) 'J\$5K!j-K! ". \$ #75K! , -K!U*6*K!3-K!j; &6\$5K!] -K!P\$. \$D)*&K!
 \$#: ;(&;F)70! .\$(*&\$.! +0.*&;+7+! F\$(7*5(+! \$56! 2-K! U:&5*K! /-K! 2:50)K! %-K! 3*56*&K!] -K! g!
 0\$&*D79*?&?!7#F\$0(! ;<|\$++7+(79*!0; # # '570\$(7;5! T\$&67#\$5K! >-! 1b_WW4-! A)*! +:56&;#*! ;<
 <&;#!*\$&.:!+(\$D*+! 1Z4K!cNNL 0;D57(79*! 7#F\$7&#*5(! 75! \$#: ;(&;F)70! .\$(*&\$.!
 cdW-! +0.*&;+7+?!\$!F;F' .\$(7;5LI\$+*6!+('6:-!

!W4-!

! , \$&*+0\$K!P-K!3&\$57;K!R-K! , \$&0;K!E-K!@*!2 '0\$K!S-K!P&\$H7\$! !
 , \$DD7*K! , -K! /0\$&0*..\$K! M-K! @*! @; #*570;K! %-K! !
 U&\$#\$5(7K! 3-K!%; 5(7!]7I\$.7K! i -K! 3; &(\$&;K! /-K! g! /7# # ;5+K! ` -! 1b_W04-! 3\$(7*5(LF*&0*79*6! ; '(0; #*+! \$56!
 /\$.9\$(&*! %\$. \$I&;K! S-! 1b_Wc4-! E 'D#*5(\$79*! G'\$.7(:! ;<! .7<*! 75! E2 /-!
 \$56! .(*&5\$(79*! 0; # # '570\$(7;5! 7#F&;9*+! \$#: ;(&;F)70! .\$(*&\$.! +0.*&;+7+!
 G'\$.7(:! ;<! .7<*! 75! ()*! *\$&.:! +(\$D*+! ;<!
 \$#: ;(&;F)70! .\$(*&\$.! +0.*&;+7+!
 1W4K!NOLDN-!