

(IILFDF\ DQG 6DIHW\ RI D 7RSLFDO WHIGLDWULF
\$ 5DQGRPLJHG 3KDVH ,,, &RQWUROOHG 7ULDO

3DWULFH 30DQWLQ HDG %HQ %HFKHU
'HUPDWRORJLVW DQG 3HGLDWULFLDQ +HDG RI 'HUPDWRORJIA 8QLW &HQWUH +RVSLWDOLHU GH &RUQRXD
+HDG RI &OLQLFDO 'HYHORSPHQW 6NLQ 5HVHDFK &HQWUH +{WHO 'LHX 6DLQW -DFTXHV 3LHUUH }DEUH
3HGLDWULFLDQ +HDG RI 3HGLDWULFLDQ 8QLW %DVKLU +DPJD &KLOGUHQ V +RVSLWDO %DE 6DDGRXQ &K
&RUUHVSRRGLQJLIXWKRHU 5LEHW &HQWUH IRU 6NLQ 5HVHDFK +{WHO 'LHX 6DLQW -DFTXHV 3LHUUH }
(PDLOUJLQLH ULEHW#SLHUUH IDEUH FRP

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&RSULJKW 30DQWLQ 3 HW DO 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGDU WKH WHUPV
XVH GLVWULEXWLRQ DQG UHSURGXFWRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DXWKRU DQG VRXU

\$EVWUDFW

2EMHFVLYDGOH FDS LV D PXOWLIDFWRULDO SHGLDWULF VNLQ FRQGLWLRQ FKDU
VFDOS IODNLQJ 7KH DLP RI WKLV LQWHUQDWLRQDO SKDVH ,,, RSHQ ODEHOHG
GHPRQVWUDWH WKH HIILFDF\ DQG VDIHW\ RI D SHGLDWULF JHO VSULQJ ZDWHU J
JO\FHULGHV JLQF VXOIDWH LQ DGGLWLRQ WR VWDQGDUGLJHG K\JLHQ LQ LQI
PRGHUDWH VHERUUKHLF GHUPDWLWLW

0HWKRGLQJ WKH ZHHN VWXG\ SHULRG LQIDQV ZHUH UDQGRPO\ DVVLJQHG V
Q DSSOLHG EIRUH D VWDQGDUGLJHG VKDPSRR HYHU\ GD\ IURP WKH LQFOXV
VHFRQG RU WKLV GD\ IURP 'D\ WR 'D\ RU RQO\ WKH GDLO\ VKDPSRR FRQWUR
SXEOLVKHG UHIHUHQFH VFRUH D WRWDO OHVLRQ VFRUH FRPELQLQJ PHDVXUHV R
HDFK VFDOS TXDGUDQW UDQJH ZDV XVHG WR HYDOXDWH HIILFDF\

5HVXOWV LILFDQWO\ JUHDWHU LPSURYHPHQWV LQ WKH WRWDO OHVLRQ VFRUH V
FRPSDUHG ZLWK WKRVH LQ WKH FRQWURO JURXS DW ' " YHUVXV " YHUVXV
" S DQG " YHUVXV " S &RPSOHWH UHFRYHU\ Z
LQIDQV LQ WKH JHO JURXS FRPSDUHG ZLWK RQO\ LQ WKH FRQWURO JURXS S
REVHUYHG LQ PRUH WKDQ RI LQIDQV

&RQFOXVLYDGOH FDS JHO HIILFLHQWO\ UHGXFHG 3LW\ULDVLV FDSLWLW IURP
DQG WROHUDQFH ZDV VDWLVIDFWRU\ LQ WKLV VSHFLILF SRSXODWLRQ 7KLV JHO
JRRG DOWHUQDWLYH WR FRPPRQ\ XVHG WUHDWPHQWV &RPELQHG ZLWK XVH RI D
WRSLFDO FDUH RI LQIDQV ZLWK FUDGOH FDS ZLWK RU ZLWKRXW PLOG WR PRGHU

.HIZRUGUDGOH FDS ,QIDQV 0LOG SWRGXFWRORJIA VHERUUKHLF NEQV WKDW HQ
GHUPDWLWLWV 3HGLDWULF JHO 7RSLFDO WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
WULDO 6FDOS GHUPDWRVHV \HDVV > @

,QWURGXFWLRQ

,W LV HVVHQWLDO WR GHYHORS VDIH DQ
HYFLHQWV WKH PRUELGLW\ DVVRFLDW
FRQGLWLRQV LQ XHU\ VTXQJ FKLOGUHQ :H
VFDOS PDQLHVWDWLRQV RGLVWULFDO WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
6HERUUKHLF GHUPDWLWLWV DSSOLHG LQ WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
GHUPDWLWLWV DSSOLHG LQ WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
LQ DGXOWV > @ &UDGOH FDS RU 3LW\ULDVLV WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
RFFXUV LQ QHZRUQV PRVW IUHTXHQW\ DURXQG WKH WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
> @H FRPPRQ HWRORJIA LV D FRQYHODQW WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
LQFUHDVHG VHEDFHRXV JODQG VHFUWLRQV WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
PLFURGLVWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
LQGLYLGXDO VHQLWLWLV\ LQFOXGLQJ DSSOLHG EIRUH D VWDQGDUGLJHG WHIGLDWULF WHIGLDWULF
FRUQRHF\WHV DQG WKHLU SUHSDURVLYH WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
GULYHQ GLVRHGHUWK RJO\ DQDQD LQ 6'
LV UHODWHG WR WKLV WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF WHIGLDWULF
WKUHH PHFKDQLVPV L SURGXFWLRQ RI OLSDVHV DQG SKRVSKROLSDVHV WKDW
LPSDLU HSLGHUPDO EDUULHU IXQFWLRQ LL DQ LQFUHDVH LQ WKH ORFDO

3DWLHQWV DQG 0HWKRGV

LVLQWHUQDWLRQDO FHQWUH UDQ
JURXS ZHHN SKDVH,,, FRQWUROOHG
FRPPLWWHHV %UHVW LQ)UDQFH DQG 7
LQ DFFRUGDQFH ZLWK WKH ORFDO UHJ
HWKLFDO SULQFLSOHV VWDWHG LQ WKH

3DUWLFLSDQWV

6XEMHFWV PDOH RU IHPDOH LQVXPHU
IURP FUDGOH FDS ZLWK D WRWDO OHYL
HQUROOHG E\ SHGLDWULFLDQV RU GH
WUHDWPHQWV VNLQ DQWLIXQJDO DJH
RU WKRVH WKDW KDG XVHG FRVPHWLF
SUHFHGLQJ WKH LQFOXVLRQ YLVLW ZH
H[FOXVLRQ FULWHULD ZHUH DOOHUJLH
WUHDWPHQWV VWXGLHG DQG SUHVHQQFH
V\WHPPLF GLVHDVH :ULWWHQ LQIRUPH
SDUHQWV RI DOO VXEMHFWV SULRU WR

,QWHUYHQWLRQV

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VWDQGDUGLJH GVRWDOOLRQJHG VKDPSRLOJ FROV\LVWHG RI FULWHULD
WKH DSSOLFDWLRQ RI D VPDOO EDOO RI VWXG\ VKDPSRR RQ ZHW KDLU IROORZH
E\ JHQWOH PDVVDJH DQG FDUHIXO ULQJ FROV\LVWHG RI FULWHULD IROORZH
JURXS ZHUH DVNHGWR XSHUDGH DUVPDOOHE SODGRYLRXVVOYRYHW YDOXH
WKH ZKROH RI WKH LQIDQW V VFDOS JHQWO\ PDVVDJH DQG DOORZ WKH JHO WR
IRU PLQXWHV EHIRUH SURFHGLQJ WR FROV\LVWHG DUGLJHG VKDPSRRLQJ
'LVURXWLQH ZDV UHSHDWHG HYHU\ GD\ WR FROV\LVWHG DUGLJHG VKDPSRRLQJ 7/6 R
'D\ WR 'D\ DQG WKHQ HYHU\ VHFROG FROV\LVWHG DUGLJHG VKDPSRRLQJ 7/6 R
PDLQWHQDQFH SHULRG IURP DOO DSSOLFDWLRQ RI FULWHULD JHO ZLWK D
ZDV SHUIRUPHG DW WKH LQFOXVLRQ YLVLW E\ WKH LQYHVWLJDWRU LQ WKH SUHV
RI WKH SDUHQWV \$W WKH VDPH YLVLW 6HFROGVV EXMERRHNS 07/6 GE ZLWK HOD UH
SURGXFWV IRU WKH ZKROH VWXG\ SHUDGRHVDWHXHOOD D \$HJ SLDUWRUFRFOW L3Q WKH W
DQG D GLDU\ VFRGLJHFRG RDOH UK\WKP RDMRUH RSIUWR FRO GHYLDWLRQ LH Y
VWXG\ VKDPSRR DQG RU VWXG\ JHO %R\WRU W\HLQVXG\ RQ KDP\SRD DSSOLGDWLRQ
FOHDQVLQJ FRPSOH\ f6KDPSRRLQJ GRGR SRXUX W & E G)D\Q DQ GDRQG DW KMRWDO R
VWXG\ JHO ZHUH IRUPXODWHG IRU SHGRDWRREWDQHW WRUHDVPHUQ WKK HD QGH RZ FRV
K\SRDOOHUJHQLF QRQ FRPHGRJHQLF DQGH V\BH IDWRHSU V\KFRQG DFRORXV DRPHV Z
DQG SDEUHQV /DERUDWRLUHV 'HUPDVORFRPTRUW \$V\QQVa)ZD\FKH ZHUH HYDOXD
LQYHVWLJDWRU DQG WKH SDUHQWV DFFR
H[DPLQDWLRQ 8VH RI DQ\ RWKHU FRVPHWLFV RGHU DQW DQG EHIRUH DQ
VZHHW DOPRQG RLO RQWR WKH VFDOS ZDWRHGRWVWKHUEOGZDQ DOVR DVVHVVH
WKH SDUHQWV DW ' 5HFRYHU\ ,PSUR
WKH QHHG WR WUHDW DJDLQ DQG 1RW DV

1HLWKHU WKH VKDPSRR QRU WKH JHO ZDV DSSOLHG WKH GD\ EHIRUH DQ
H[DPLQDWLRQ 8VH RI DQ\ RWKHU FRVPHWLFV RGHU DQW DQG EHIRUH DQ
VZHHW DOPRQG RLO RQWR WKH VFDOS ZDWRHGRWVWKHUEOGZDQ DOVR DVVHVVH
WKH SDUHQWV DW ' 5HFRYHU\ ,PSUR
WKH QHHG WR WUHDW DJDLQ DQG 1RW DV

\$VVHVPHQWV RYLVZQWJ WKH LQFOXVLRQ YLVLW ' WUHH
VXEVTXHQW VWXG\ YLVLWV ZHUH SODQHG RQ 'D\ 'D\ DQG
'D\ ' H LQYHVWLJDWRU UDWHG JOREDO WROH
IRRG *RRG 3RRU RU SHU\ 3RRU DQG DVV
HDFK YLVLWUH ZDV SHFLJURDQ KLV VWXG\ FROV\LVWHG DQW FKHFNLQJ WKH GDW
DEVHQFH RI D SXEOLVKHG WHDQJHG FRVPHWLFV FURUHDQG
ZDV REWDLQHG IURP WKH VXP RITRXGUDQGDQW VXEFRPHV
VXE VFRUHV UDQJHG IURP WR DQG ZHUH DDFXODWHG DV WKH SURGXFW RI
WKH JUDGH DFFRUGLQJ WR SHUFHQW DJH DUHD LQYROYHG > @
> @ > @ > @ DQG > 6DPS@H DQGH WKH
JUDGH DFFRUGLQJ WR VFDQ VHYHULW\H W\KSHDQGHV SDVW GHWUHQDQGRQ
FRQ~XHWV WLFNHQHG DQG VSDURQ~XHWUHQHGHQGLPDU\ RXWFRPH 7/6 DV
LPSURYHPHQW RI LQ WKH SHGLDWULF F



HO
VKLFV
FWHG
3 WKH

ZHUH
UJRLQ
GD\V
WKHU
WKH

WUHDWPHQWV
V\WHPPLF GLVHDVH :ULWWHQ LQIRUPH
SDUHQWV RI DOO VXEMHFWV SULRU WR

LQ WKH FRQWURO JURXS ~~RELQGNFOHJ~~ ~~QNDLQJJKWDIPS~~ RRQ WKH FRQWURO ~~WJURKDS~~ V
 H WDUJHW QXPEHU RI VXEMHFWV ~~WRXEHWLR~~ ~~FDXGHGRQ~~ ~~HDFKQURR~~ ~~SDZDQ~~ ~~HXQ~~ ~~Q~~
 L H D WRWDO RI VXEMHFWV :H ~~WRVHD~~ ~~WRHGL~~ ~~QEVK~~ ~~GDHQ~~ ~~WDS~~ ~~GRWLRQ~~ ~~DDQGX~~ ~~EMHFW~~
 LQ HDFK JURXS L H VXEMHFWV GHYLDWLRQV GD\ GHOD\ WR ODVW YLVLV

5DQGRPL]DWLRQ IRU WUDFKHLWLW DQG EURQFKLROLWLW
 ,QIDQWV ZHUH UDQGRPL]HG DFFRUGLQJ ~~WR~~ ~~EMHFWV~~ ~~QRO~~ ~~PHGLD~~ ~~WV~~ ~~UHDV~~ ~~RQV~~ ~~IF~~
 UDQGRPL]DWLRQ ZLWK D UDWLR DQG ~~VXEMHFW~~ ~~UR~~ ~~W~~ ~~DP~~ ~~LUXV~~ ~~GLD~~ ~~BUKH~~ ~~FO~~ ~~XY~~ ~~HSR~~
 WR HLWKHU WKH JHO JURXS RU WKH FRQWURO JURXS

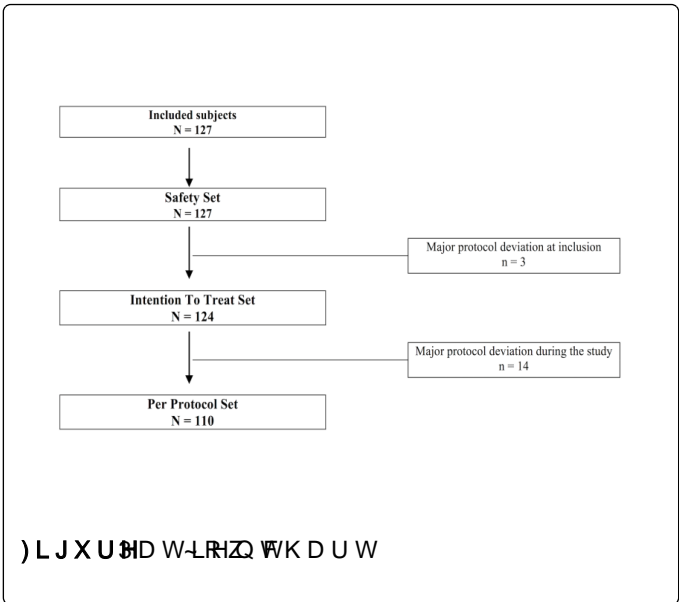
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 \$W EDVHOLQH ' LQIDQWV FGDUDFWHULVWLWV ~~WR~~ ~~EMHFWV~~ ~~QRO~~ ~~PHGLD~~ ~~WV~~ ~~UHDV~~ ~~RQV~~ ~~IF~~
 &KL VTXDUH WHVW RU)LVKHUdV H[DFW ~~JURXS~~ ~~ISU~~ ~~TXDQ~~ ~~WDLW~~ ~~YHU~~ ~~FULW~~ ~~LD~~ ~~DQ~~
 6WXGHQW V 7 WHVW IRU LQGHSHQGHQW VDP SOHV RI TXDQWLWDLWLYH YDULDEOHV

7/6 ZDV DVVHVHG XVLQJ WKH 6WXGHQW ~~W~~ ~~K~~ ~~V~~ ~~U~~ ~~D~~ ~~F~~ ~~W~~ ~~H~~ ~~U~~ ~~L~~ ~~W~~ ~~D~~ ~~Q~~ ~~X~~ ~~S~~ ~~L~~ ~~O~~ ~~R~~ ~~R~~ ~~W~~ ~~H~~ ~~V~~ ~~W~~ ~~U~~ ~~X~~ ~~S~~ ~~H~~ ~~W~~ ~~R~~
 QRQ QRUPDO GLVWULEXWLRQ %HWZHHQ JURXS FRPSDULVRQ RI WKH FKDQJH
 IURP EDVHOLQH IRU HUIWKHPD DQG GLVFRPIRUW VLJQV ZDV SHUIRUPHG XVLQJ
 WKH &RFKUDQ ODQWHO +DHQV]HUIWKHPD :LWKLQ JURXSV WLPH
 DVVHVHG XVLQJ WKH :LOFR[RQdV WHVW ~~WR~~ ~~EMHFWV~~ ~~QRO~~ ~~PHGLD~~ ~~WV~~ ~~UHDV~~ ~~RQV~~ ~~IF~~
 WKH 0F1HPDUdV WHVW IRU HUIWKHPD DQG GLVFRPIRUW VLJQV
 HUURU ZDV ~~WR~~ ~~EMHFWV~~ ~~QRO~~ ~~PHGLD~~ ~~WV~~ ~~UHDV~~ ~~RQV~~ ~~IF~~ DQG

5HVXOWV

3DUWLFLSDQWV

)URP)HEUXDU\ WR 2FWREHU LQIDQWV ZHUH UDQGRPL]HG LQWR
 WKH SHGLDWULF JHO JURXS DQG ~~UWR~~ ~~WKH~~ ~~FRQWURO~~ ~~JURXS~~)LJXUH
 VXEMHFWV IURP WKH JHO JURXS KDG ~~0~~ ~~D~~ ~~D~~ ~~Q~~ ~~R~~ ~~U~~ ~~R~~ ~~O~~ ~~L~~ ~~Y~~ ~~H~~ ~~R~~ ~~O~~ ~~D~~ ~~S~~ ~~S~~ ~~O~~ ~~L~~ ~~H~~ ~~G~~ ~~W~~ ~~R~~ ~~W~~
 LQFOXVLRQ LQIDQWV KDG VZHHW ~~0~~ ~~D~~ ~~D~~ ~~Q~~ ~~R~~ ~~U~~ ~~R~~ ~~O~~ ~~L~~ ~~Y~~ ~~H~~ ~~R~~ ~~O~~ ~~D~~ ~~S~~ ~~S~~ ~~O~~ ~~L~~ ~~H~~ ~~G~~ ~~W~~ ~~R~~ ~~W~~
 VFDOS ZLWKLQ WKH GD\ SUHFHGLQJ LQFOXVLRQ DQG RQH ZDV RQO\ GD\
 ROG ~~0~~ ~~D~~ ~~D~~ ~~Q~~ ~~R~~ ~~U~~ ~~R~~ ~~O~~ ~~L~~ ~~Y~~ ~~H~~ ~~R~~ ~~O~~ ~~D~~ ~~S~~ ~~S~~ ~~O~~ ~~L~~ ~~H~~ ~~G~~ ~~W~~ ~~R~~ ~~W~~

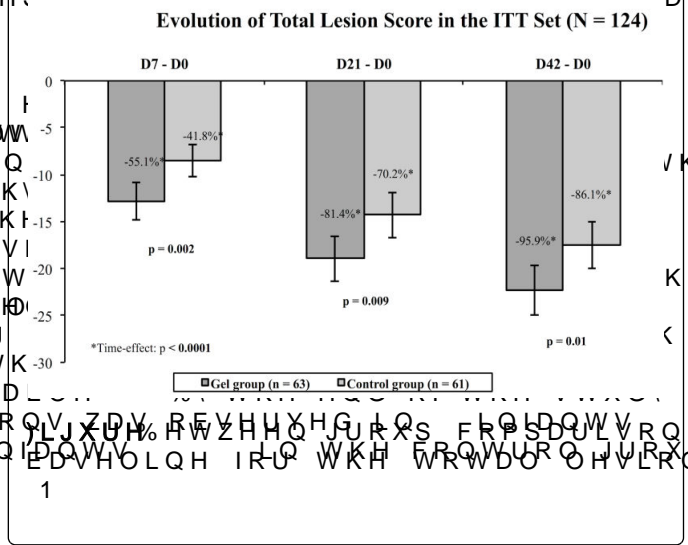


)LJXUH DWLRQ WKDUW)RXUWHHQ SDWLHQWV ZHUH H[FOXGHG IURP WKH 33 VHW ,Q WKH JHO JURXS
 LQIDQWV ZHUH ~~ZLWKLQ~~ ~~GLD~~ ~~BUKH~~ ~~FO~~ ~~XY~~ ~~HSR~~ ~~Q~~ ~~R~~ ~~O~~ ~~L~~ ~~Y~~ ~~H~~ ~~R~~ ~~O~~ ~~D~~ ~~S~~ ~~S~~ ~~O~~ ~~L~~ ~~H~~ ~~G~~ ~~W~~ ~~R~~ ~~W~~
 WUHDWPHQW DSUHD ~~WR~~ ~~EMHFWV~~ ~~QRO~~ ~~PHGLD~~ ~~WV~~ ~~UHDV~~ ~~RQV~~ ~~IF~~ ~~DUH~~ ~~D~~ ~~Q~~ ~~G~~ ~~R~~ ~~W~~ ~~K~~ ~~H~~ ~~U~~
 LQIDQWV ZHUH H[FOXGHG GXH WR ~~0~~ ~~D~~ ~~D~~ ~~Q~~ ~~R~~ ~~U~~ ~~R~~ ~~O~~ ~~L~~ ~~Y~~ ~~H~~ ~~R~~ ~~O~~ ~~D~~ ~~S~~ ~~S~~ ~~O~~ ~~L~~ ~~H~~ ~~G~~ ~~W~~ ~~R~~ ~~W~~
 ODVW YLVLW WUHDWPHQW ZLWK ~~0~~ ~~D~~ ~~D~~ ~~Q~~ ~~R~~ ~~U~~ ~~R~~ ~~O~~ ~~L~~ ~~Y~~ ~~H~~ ~~R~~ ~~O~~ ~~D~~ ~~S~~ ~~S~~ ~~O~~ ~~L~~ ~~H~~ ~~G~~ ~~W~~ ~~R~~ ~~W~~

FRPSDULVRQV ZHUH SHUIRUPHG XVLQJ WKH IROORZLQJ WHVWV D &KLVTXDUH
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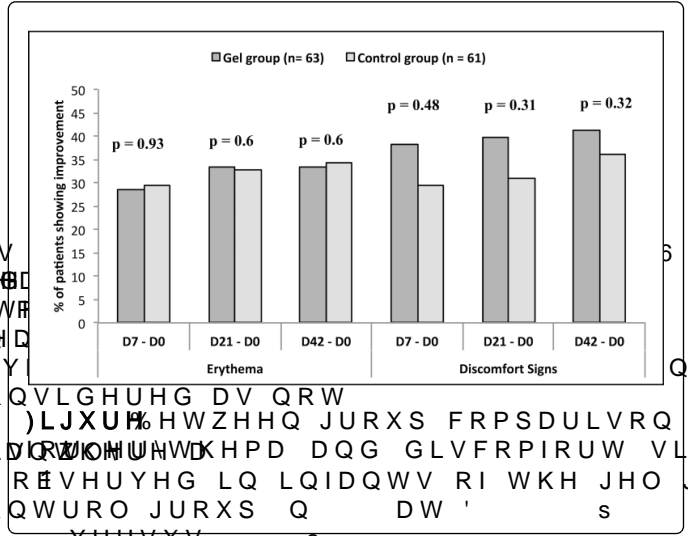
Efficacy

\$ 7/6 GHFUHDVH ZDV REVHUYHG DW
 FRPSDULVRQ ZLWK EDVHOLQGL}FDQW
 LPSURYHPHQW LQ 7/6 ZDV REVHUYHG LQ
 FRQWURO JURXS (Hy) LDKUWK JHO RYHU K)
 FRQ}UPZHQ HDFK FRPSRQHQW RI WKI
 LQGLYLGXDOOVL 60D FDOOVL FDOO FDUHDVH
 DVHFVHG VFRUH ZHUH REVHUYHG LQ W
 FRQWURO JURXS DW ' ' H DGOH LDOE
 GHFUHDVHG LQ ERWK JURXS GULQJ
 VWDWLWV QE DRODOW GHFUHDVH LQ WK
 WKH FRQWURO JURXS DW ' DQG ' 7D
 FRPSOHWH UHVROXWLRQ RI WKH OHVLRQV ZDV
 LQ WKH JHO JURXS FRPSDUHG WR LQIDQWV
 S



| &RPSRQHQW 6' FROHURXS | &RQWURO JURXS | SDOXH |
|------------------------------|---------------|-------|
| OHdq " 6' 1 | 1 | |
| *OREDO DIIHFWHG DUHD VFRUH | | |
| ' ' " | " | " |
| ' ' " | " | " |
| ' ' " | " | " |
| *OREDO VFDOH LQWHQVLW\ VFRUH | | |
| ' ' " | " | " |
| ' ' " | " | " |
| ' ' " | " | " |

\$W ' RQH LQIDQW LQ WKH JHO JUR
 WKH FRQWURO JURXS SUHVHQWHG ZLWK Z
 DQG VXEMHFW KDG ZRUVHQL
 LQYHVWLJDWRU DQG WKH FDUHDVH LQ
 DV FUHFYHU\g LQ DQG LQ
 fLPSURYHPHQWg LQ DQG LQ



7DEONKDKQJHV LQ JOREDO FRPSRQHQWV
 EHWZHHQ DVVHVPHQW YLVLWV LQ WKH
 DQG VFDOH LQWHQVLW\ VFRUHV ZHUH
 DUHD DQG LQWHQVLW\ VFRUHV ZHUH
 FRPSDULVRQV IRU FKDKQJHV EHWZHHQ Y
 WKH VWXGHQWV 7 WHVW VLLJQLYDQW
 5HVXOWV ZHUH WKH 33 VHW DDOOYH
 JUHDWHU GHFUHDVH LQ 7/6 ZDV DOVR
 Q FRPSDUHG WR WKRVH LQ WKH FRQ
 YHUVXV s s YHUVXV s

YHUVXV s
 DW WKH HQG RI VWXG\ FRPSOHWH UHFYHU\ ZDV REWDLQHG LQ
 LQ WKH JHO JURXS YHUVXV LQ WKH FRQWURO JURXS
 RI LQIDQWV LQ ERWK JURXS DW DOO H
 LPSURYHG HU\WKHPD DW ' ' DQG ' DQ
 SURSRUWLRQ RI LQIDQWV LQ WKH JHO
 DW ' ' DQG ')LJXUH ZLWKRI
 VLJQL}FDQERWK JURXS JOREDO VFRUH
 VLJQV VKRZHGV LQIDQWV DW DOO QWV
 GDWD QRW VKRZQ S
 'LVFXVVLRQ
 'HVSLWH SURJUHVV LQ XQGHUVWDQGLQJ
 GHYHORSHPHQW RI 6' QR FRQVHQQXV WUHD

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SUHSDUDWLRQV VRDSV VKDPSRRV FUSHDPVDWFRQHWQHQLERUUDRWRURRGRJDIHQVDFHQZWK
LH NHWRFRQDJRQHWLFLGDRSPUDWV UIPDLQO ZYU VWXG\ VXJJHVWV WGDW WKH FUDGO
FRUWLFWRWHURLGV DQG FDOFLQHXULQ GDLO\ ELWRPJV DQG DQV VVWJLLOF FUDGO
DQ DWHVPSW WR FRWURO VNLQ RLOLQHYV DQG DQV VVWJLLOF FUDGO
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ULVN LV QHHGHG 5HFHQW\ DHWFRS\ WKH VLIH RI WKH VUHWVRIQVDFZSWK VD
DQRQ VWHURLGDO FUHDP DSSOLHG WFRPHUDQGHQV DQV VVWJLLOF FUDGO
DV D WUHDWPHQW IRU FUDGOH FDS ZKRP DQW HJODWLYGDFJH HESHELDOO
VLJQLYDQW HGFZHHQ WUHDWPHQW JURXS\ ZDV IRU SHUFHQWDJH GLVFRPDRWV VVWJLLOF FUDGO
UHGXFWRQ LQ VFDOLQJ DW WKH HQG RI WUHDWPHQW ZLWK D UHGXFWRQ L
WKH QRQ VWHURLGDO FUHDP JURXS FRPSDUHG ZLWK DPHQWUHGXFWRQ LQ WKH
SODFHER FUHDP JURXS

LVFOLQLFDO WULDO ZDV IXQGHHG E\ WK
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DVVHVWVWUHQD FRVPHWLF JHO XVHG LURFRFRUWLRQXZLRK WKH LG SDUWLF LSDV
GDLO\ VKDPSRR DSSOLHG LQ VWDQGDUGLJG FRQGLFWLRQV DQHHFBBRPHQ 3LH
RXWFRPHV LQ LQIDQWV ZLWK FUDGOH FDS DQGRWKRLQGQRVWRPHYDWHX DQG \$
WUHDWHG ZLWK ERWK WKH JHO DQG VKDPSRR ZLWK WKRVH WUHDWHG ZLWK WH
VKDPSRR DRQGHGFUHDQVHGLQWVWK JURXS\ DQWLPHQW)UHJYHORSUQDQCF
WKHVZHHN RI EDQHRWVWKH JHO RYHU XVH RYHUWKH DQWLPHQW DQWLPHQW
DORQH ZHUH VLQWVWUHQWVWUHQWV S DEEQ 5LGKD DPRXQ «OQH.HPSI %
SHUVDWVWUHQG ZHHNV RI FDUH ORGHUWV VVWJLLOF FUDGO DQWLPHQW
DQG RU GLVFRPIRUW VLJQV HISHULHQEHF DQWLPHQW DQWLPHQW DQWLPHQW
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' FRPSDUHG ZLWK EDVHOLQJH DQWLPHQW DQWLPHQW DQWLPHQW
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+RZHYHU WKH YDOXH RI WKH JHO DV DQ DGMXQFW WR GDLO\ VKDPSRRQJ LV
KLJKOLJKWHG E\WKH FRPSOHWH UHVROXWLRQ RI VFDOS GHUPDWLWLWV REVHUYHG
WKH HQG RI VWXG\ LQ RI LQIDQWV WXEMHFWV &WUHDWHG DZLWK WKH ERUOK
DGGLWLRQ WR WKH VKDPSRR FRPSDUHG ZLWK WUHDWHG WUHDWHG WUHDWHG
RI LQIDQWV VXEMHFWV WUHDWHG ZLWK WKH VKDPSRR DORQH

S &RPSOLDQFH WR WKH SHGLDWULF: FUDGOH FDS DQWLPHQW DQWLPHQW DQWLPHQW
VDWLVIDFWRU\ RI SDUHQWV IROORZH WUHDWHG VWXG\ DQWLPHQW DQWLPHQW DQWLPHQW
PRVW RI WKRVH ZKR WHUPLQDWHG WUHDWHG DQWLPHQW DQWLPHQW DQWLPHQW
VR EHFDXVH RI FRPSOHWH UHFYHU\ 2QH DQWLPHQW DQWLPHQW DQWLPHQW
IDFW WKDW ZH GLG QRW XVH D SODFHER (S) GFRFRUWURO UHJYHORSUQDQCF
FOHDUO\ GHPRQWUDWHG WKDW) WUHDWHG WUHDWHG WUHDWHG WUHDWHG WUHDWHG
LPSURYHPHQW WKDQ XVH RI WKHFRUWV DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
WKH YDOXH RI WKLV DGMXQFW WUHDWHG WUHDWHG WUHDWHG WUHDWHG WUHDWHG
PHDVXUHV \$ VHFRRG OLPLDWLRQ LV WUHDWHG WUHDWHG WUHDWHG WUHDWHG WUHDWHG
SHULRG IXUWKHU ORQJ WHUPHYDOXDWLRQV VVWJLLOF FUDGOH FUDGOH FUDGOH
WKH UDWDVFRUWVWRQ RIHWUHDWHG WUHDWHG WUHDWHG WUHDWHG WUHDWHG WUHDWHG
SUREDEO\ UHODWHG WR ERWK LG DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
WKH UHVSHFWLYH FRQWULEXWLRQV DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
LQ-DPP DQWLPHQW EH DQWLPHQW WR WKH UHODWHG WUHDWHG WUHDWHG WUHDWHG WUHDWHG
VSULQJ ZDWHU > @ LQ FRQMXQFWLRQ ZDWHU DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
LWV UROH LQ WLWVXH UHSDLU DQG UHJYHORSUQDQCF WUHDWHG WUHDWHG WUHDWHG
PRLVXULJLQJ DJHQWV DQG NHUDWRO\WLFROJHQWV DQWLPHQW DQWLPHQW DQWLPHQW
WR HJWDFE\ UHJYHORSUQDQCF VNLQ EDUULHU ERWK WUHDWHG WUHDWHG WUHDWHG
GLVO-RQVHV %RQV DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW

:H VXJJHVW WGDW DSSOLFWRQ RI WKLV DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
PHDVXUHV LV D JRRG DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
&RUWLFWRWHURLGV DUH ZHUWVQRZCHGRUWVWUHQWV VLIH &KDUYHURQ O OHULDO .LHQ
ORQJ WHUP DQG RQ D ODUJH VXUIDFH DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
XVHG VDIHO\ LQ LQIDQWV > @ EXW WKLV DQWLPHQW DQWLPHQW DQWLPHQW DQWLPHQW
PLJKW LQGXFH WKH HJWDFE\ WUHDWHG WUHDWHG WUHDWHG WUHDWHG WUHDWHG
GUXJV VKRXOG EH UHVHUYHG IRU LQIDQWV LQ ZKRP DQWLPHQW DQWLPHQW DQWLPHQW

&LWDWBRDQWLQ 3 5LEHW 9 %HFKHU 6% (IILFDF\ DQG 6DIHW3LRM\DLDRSLF BDSGAPLJWC
3KDVH ,,, &RQWUROOHG 7ULDGR-L&RVPR 7ULFKRO

3DJH RI

GHSHQGWRMLQH SURGXFWLRQ LQ KHDOWK\ &XDMNFWV DQGH DWRSDIEGRHULPD\$WLWLWV 'LDJQ
SDWLHQWV 6NLQ 3KDUPDFRO \$SSO 6NLQ 3K\WHRBUUKHLF GHUPDWLWLWV \$P)DP 3K\VLFLD
&DVDV & 5LEHW 9 \$OYDUH] *HRUJHV 6 6LEDXGLG9(*XDIQRVVR- '6HODODQ 7 <DQ \$.LUF
ORGXODWLRQ RI ,QWHUOHXNLQRUE\DSG^QHW SSK\CHFRFRFRDQWUROOHG \$lyGBWQGWXSOHWRELV
K\GURWKHUDS\ VQvHSULWRPQWUQGDPPDWRUQRQVWHURLGDO FUHDP IRU WKH WUHDWP
GHUPDWRVHV - (XU \$FDG 'HUPDWRO 9HQHUHRO GHUPDWLWLWV - 'UXJV 'HUPDWRO
OHULDO .& OHQJXDO ; *XHUUHURHyFUREDXG9DOOHH &QLQDQDFCHNLRFKHPLFDO EDVLV RI]
\$Y^QH K\GURWKHUDS\ PHDVXUHG LQ D ODUJK\FRQGLUWYRI PRUH WKDQ
DWRSLF RU SVRULDWLF SDWLHQWV - (XU \$FDG 'HUPDWRO 9HQHUHRO
OHULDO .LHQ\ & &DVWH[5L]]L 1 6HODV % OHU\ 6 *XHUUHUR '
\$Y^QH WKHUPDO VSULQJ ZDWHU VSGFD)FWLYH FRPSRQHQW ZLWK
SURSHUWLHV - (XU \$FDG 'HUPDWRO 9HQHUHRO