

3URJQRVWLF )DFWRUV LQ 2Q\FKRP\FRVLV 7UHI

6KDUL 5 /LSQULFKDUG . 6FKHU

:HLOO &RUQHOO 0HGLFDO &ROOHJH 'HUPDWRORJ\ 1HZ <RUN 86\$

&RUUHVSRRGLQKDWORU 'HUPDWRORJ\ :HLOO &RUQHOO 0HGLFDO &ROOHJH 'HUPDWRORJ\ &RUQHOO 'H  
7HO (VFDLO #PHG FRUQHOO HGX

5HF GDWH 1RY \$FF GDWH -DQ 3XE GDWH

RQ\FKRP\FRVLV 2UJDQLVPV WKDW UHVSRRG SRRUO\ WR WUHDWPHQW DUH  
 QRQGHUPDWRSK\WH PROG V \HDVWV DQG PL[HG EDFWHULDO DQG IXQJDO  
 LQIHFWLRQV ([DPSOHV RI WKHVV IHDWXUHV DUH VKRZQ LQ )LJXUH

3DWLHQW &KDUDFWHULVWLFV DQG	ORDEOGLHWHUHV	2UJDQLVP
2OGHU DJH	6XEXQJXDO K\SHUNHUDWRVLV	1RQG EDUWHULDO DQG IXQJDO LQIHFWLRQV

3UHYLRXV QDLO WUDXPD  
 +LVWRU\ RI RQ\FKRP\FRVLV 'HUPDWRSK\WRPD 1RQG HUPDWRSK\WH PROG V  
 ,PPXQRVXSSUHVVLQR GXH WR PHGLDWRROORJGLVHDVH HPHQW !  
 3HULSKHUDO YDVFXODU GLVHDVH 6ORZO\ JURZLQJ QDLOV  
 +DOOX[ LQYROYHPHQW  
 6HYHUH RQ\FKRO\VLV  
 3DURQ\FKLD  
 8QFRQWUROOHG GLDEHWHV PHOOLWXV  
 0HODQRQ\FKLD  
 0DWUL[ LQYROYHPHQW  
 7RWDO G\ VWURSKLF RQ\FKRP\FRVLV

2Q\FKRP\FRVLV DIIHFWV DSSUR[LPDWHO\ RQH WKLUG RI SDWLHQWV ZLWK  
GLDEHWHV DQG PD\ LQFUHDVH WKH VHYHULW\ RI IRRW GLVRUGHUV VXFK DV  
QRQKHDOLQJ XOFHUV DQG VHFRQGDU\ LQIHFWLRQV > @ 7KH VHYHULW\ RI  
RQ\FKRP\FRVLV LV VLJQLILFDQWO\ DVVRFLDWHG ZLWK WKH OHQJWK RI WLPH WKH  
WKH LQGLYLGXDO KDV GLDEHWHV > @ 6WXGLHV KDYH VKRZQ WKDW ZKLOH WKH  
FXUH UDWL LV QRW VWDWLWVWLFDOO\ GLIIHUHQW EHWZHHQ GLDEHWLF DQG QRQ G  
SDWLHQWV > @ UHFUHQFH UDWL DQG GXUDWLRQ UHTXLUHG IRU FRPSOHW  
FXUH DUH KLJKHU > @

1DLO )HDWXUHV

6XEXQJXDO K\SHUNHUDWRVLV LV GHILQH DV D WKLFNHQLQJ RI WKH VWUDWXP  
FRUQHXP DQG LV D UHDFWLRQ WR WKH IXQJDO LQIHFWLRQ ,W PD\ EH PHDVXUHG  
XVLQJ D UXOHU RU FDOLSHUV IURP WKH QDLO EHG WR WKH QDLO SODWH \$OWKR  
WKLW IHDWXUH KDV EHHQ FLWHG DV D SRRU SURJQRVWLF VLJQ WR GDWH WKHUH  
VWDWLWVWLFDO VXSSRUW > @ ,W LV WKRXJKW WKDW WKLW WKLFN GHEULV  
EDUULHU WR ERWK WRSLFDO DQG V\VWHPLF WKHUDSLHV ,W KDV EHHQ VXJJHVW  
WKDW PHFKDQLFDO GHEULGHPHQW RI WKH QDLO XQLW XVLQJ D FXUHHW FOLSS  
RU SDUWLDO FKHPLFDO DYXOVLQJ EHG XVHG WR UHGXFH WKH IXQJDO ORDG DQG P  
EH DQ DGMXQFW WR WRSLFDO RU RUDO GUXJV > @

0DQ\ DXWKRUV KDYH FLWHG VLJQLILFDQW ODWHUDO GLVHDVH DV D SRRU  
SURJQRVWLF VLJQ IRU RQ\FKRP\FRVLV WKHUDS\ > @ :KHQ WKH QDLO  
SODWH LV WLJKWO\ ERXQG WR WKH XQGHUO\LQJ QDLO EHG V\VWHPLF DQWLIXQJ  
QRUPDOO\ UHDFK WKH QDLO SODWH YLD UDSLQJ GLIIXVLQJ DFURVV WKH QDLO E  
> @ ,Q D VWXG\ RI SDWLHQWV ZKR ZHUH WUHDWHG ZLWK D FRXUVH RI  
RUDO WHUELQDILQH RU LWUDFRQDJROH IRU RQ\FKRP\FRVLV LQ WKH  
QRQUHVSRRGHUV WKHUH ZDV LQYROYHPHQW RI WKH ODWHUDO HGJH RI WKH QD  
SODWH 7KH DXWKRUV K\SRWKHVLJHG WKDW WKHUH ZDV SRRU SHQHWUDWLRQ RI V

FXUH ,W KDV EHHQ VXJJHVWHG WKZLWKWKHEPDMRHLULLVDOEHLQGHFMDLXVCHGHEJ GH  
 3VHXGRPRQDV RU YLUDO LQIHFWLRQ HPBVVKHURSPRQKIRXQGRDWHWHVHDOHGHVEHQV  
 IROORZHG E\ DSSURSULDWH DQWLIXQJEDOHVLFHDXDS\VRXWVWHLXPC\FISIFLFRWL\$VSH  
 > @  
 &DQGLGD RQ\FKRP\FRVLV PD\ DOVR SRUWHG D SRRU SURJQRVLY @ DVVRFLD  
 7KLV PD\ EH GXH WR WKH IDFW WKDW WKLV PD\ SEH ERGXRWRWKHGLVLEEXOW\ LQ  
 DVVRFLDWHG ZLWK LPPXQRVXSSUHVVLRODERUDWU\ ERQRFKRYV\FRYLW\LVQDQW  
 FKDUDFWHULVWLF IHDWXUH RI SDWLHQRPPFQW\FRQDFLQDQW\FXWQDGGW  
 FDQGLGLDVLV &0& ZKR KDYH SRRU FHOOPHGLDWHG\LRRIQDLOLQIHFWLRQV  
 DGGLWLRQ LQ D VWXG\ RI +,9 SRVLWLYH SDWLHQWV IURP> 1RUWK DQG  
 6RXWK \$PHULFD WKH SUHYDOHQFH RI RQ\FKRP\FRVLV ZDV ZLWK  
 FDXVDWLYH RUJDQLVPV LGHQWLILHG DV GHUPDWRSK\WHPV 8VHG WR 3UHGLFW  
 > @ )XUWKHUPRUH FDQGLGD QDLO LQHFWRUQV\PDHEH IRUHQFRFRQ\FRVLV K  
 ZKHQ KRUV LPPXQLW\ LV VXSSUHVVHG SXFKFDLQ FRQVHQLVSSURSDUDW\WKH  
 HFWRGHUPDO GHIHFV DQG HQGRFXWPHPHGLYRHHU\WHPVXGLQ LQFRUS  
 K\SRWK\URLGLVP K\SRSDUDWK\URLGLV\SRDQHGZLWKSRQGSGRDGHVW WKD  
 PHOOLWXV > @ ZHLJKWV JLYHQ WR HDFK IDFWRU 7KUHH V  
 1RQGHUPDWRSK\WH PROG V 1'OV DUH D GHODQPHOYHURPSDULVHQ 7DEOH  
 RQ\FKRP\FRVLV DFFRXQWLQJ IRU DSSUR[LPDWHO\ RI FDVHV ZRUOGZLGH

6FRULQJ &OLQLFDO ,QGH[ IRU 2Q\FKRP\FRVLV ,QGH[ E\ %DUDQ HWZDQKRP\FRVLV 6HYHULW\ ,QGH[			
'HSWK RI LQYROYHPPHQW G	([WHQW RI LQYROYHPPHQW	\$UHD RI LQYROYHPPHQW	
'HJUHH RI K\SHUNHUDWRVLV K	'LIIXVH QDLO SODWH WKLFNHQDLOQJ ZLWK DFFRQVSK\WRPHDNV	PP	
&OLQLFDO IRUP GLVWDO ODWHUDO VXSHUILFLDO ZKLWH RQ\FKRP\FRVLV	VXEXQJXDO SURILPDO VXEXQJXDO 1DLP SODWH WKLFNHQDLOQJ ZLWK DFFRQVSK\WRPHDNV		
/RFDWLRQ ILQJHUQDLOV WKXP WRHQDLO O	EODLO RU WRHQDLOV JHHW RFDWLRQ WKXP E RU WRHQDLOV R[LPUWWRWPHGDLVDVH WR	WKH P	
\$JH RI SDWLHQW D	\$JH RI 3DWLHQW		
	3DURQ\FKLD		
	0HODQRQ\FKLD		
	3UHVVHFH RI GLDEHWHV PHOOLWXV LPPXQRVXSSUHVVLRQ SHULSKHUDO YDVFXODU GLVHVVH		
	&DXVDWLYH RUJDQLVP 6F\W \HDVW	DOLGLXP VSS PROG	
	2Q\FKRO\VLV		
)LQDO VFRUH > G I I K I RU RQOLQH RU GRZQORDGDEOH ZZZ RQ\FKRLQGH[ FRP	DLQDO VFRUH REWDLQHG E\ LQGLD\XGDDWRIDFVWV LQGLD\XGDDWRIDFVWV	)LQDO VFRUH 6FRUH IRU DUHD RI LQ IRDJGLDRI\LEWUHRIRULVHVVH WR PD GHUPDWRSK\WRPD RU VXEXQJXDO K PP	

7DEOH RPSDULVRQ RI )DFWRUV 8VHG LQ 2Q\FKRP\FRVLV 6FRULQJ 6\WVHPV 6LPLOD

7KH HDUOLHVW PHWKRG ZDV GHYLVHG E\ 6HUJHHY HW DO > @ DQG QDPHG  
 WKH 6FRULQJ &OLQLFDO ,QGH[ IRU 2Q\FKRP\FRVLV 6&,2 ,W LQFOXGHV D  
 ffolqlfdo lqgh[ frpsrqhwg zklfk wdnhv lqwr dffrxqw wcđk wdn `δερ Å



\*XSWD \$. 6FKHU 5. 'H 'RQFNHU 3 &XUHQHQRGDUHQBQW RI 2Q\FKRP\FRVLV D  
RQ\FKRP\FRVLV \$Q RYHUYLHZ 'HUPDWRO &OLQ  
%DUDQ 5 GH 'RQFNHU 3 /DWHUDO HGJH QDLO LQYROYHPPHQW LQGLFDWHV  
SRRU SURJQRVLV IRU WUHDWLQJ RQ\FKRP\FRVLV ZLWK WKH QHZ \V\WHPLF  
DQWLIXQJDOV \$FWD 'HUP 9HQHUHRO  
\*XSWD \$. .RQQLNRY 1 /\QGH &: 6XPPHUEHOO 5& \$OEUVNL ' HW DO  
2Q\FKRP\FRVLV SUHGLVSRVHG SRSXODWLRQV DQG VRPH SUHGLFWRUV RI  
VXERSWLPDO UHVSQRVH WR RUDO DQWLIXQJDO DJHQWV (XU - 'HUPDWRO  
0XQR &6 6KXVWHU 6 7KH URXWH RI UDSLQ DFFHVV RI GUXJV WR WKH  
GLVWDO QDLO SODWH \$FWD 'HUP 9HQHUHRO  
'\NHV 3- 7KRPDV 5 )LQOD\ \$< 'HWHUPLQDWLRQ RI WHUELQDILQH LQ  
QDLO VDPSONV GXULQJ \V\WHPLF WUHDWPHQW IRU RQ\FKRP\FRVHV %U -  
'HUPDWRO  
0DWWKLH 'RQFNHU 3 &DXZHQEHIJK \* :RHWHQERUJKV 5 YDQ GH  
9HOGH 9 HW DO ,WUDFRQDJROH SHQHWUDWHV WKH QDLO YLD WKH QDLO PDWULI  
DQG WKH QDLO EHG DQ LQYHVWLJDWLRQ LQ RQ\FKRP\FRVLV &OLQ ([S 'HUPDWRO  
6RPPHU 6 6KHHKDQ 'DUH 5\$ \*RRGILHOG 0- (YDQV (\* 3UHGLFWLRQ  
RI RXWFRPH LQ WKH WUHDWPHQW RI RQ\FKRP\FRVLV &OLQ ([S 'HUPDWRO  
.LP -( 3DUN +- /HH -< &KR %. 7KH &RPSOLDQFH DQG /RQJ WHUP  
)ROOZ XS RI 2Q\FKRP\FRVLV 7UHDWPHQW .RUHDQ -RXUQDO RI 0HGLFDO  
0\FRORJ\  
<X +- .ZRQ +0 2K '+ .LP -6 ,V VORZ QDLO JURZWK D ULVN  
IDFWRU IRU RQ\FKRP\FRVLV" &OLQ ([S 'HUPDWRO  
\*H\HU \$6 2QXPDK 1 8\WWHQGDHOH + 6FKHU 5. 0RGXODWLRQ RI  
OLQH DU QDLO JURZWK WR WUHDW GLVHDVHV RI WKH QDLO - \$P \$FDG 'HUPDWRO  
1D \*< 6XK 0. 6XQJ <2& 6. \$ GHFUHDVHG JURZWK UDWK RI WKH  
WRHQDLO REVHUYHG LQ SDWLHQWV ZLWK GLVWDO VXEXQJXDO RQ\FKRP\FRVLV  
\$QQDOV RI 'HUPDWRO  
\*XSWD \$. 6LEEDOG 5\* /\QGH &: +XOO 35 3UXVVLFN 5 HW DO  
2Q\FKRP\FRVLV LQ FKLOGUHQ SUHYDOHQFH DQG WUHDWPHQW VWUDWHJLHV - \$P  
\$FDG 'HUPDWRO