



# -RXUQDO RI \$GGLFWLRQ 5HVHDFK 7KHUDS\

<DQJ HW DO - \$GGLFW 5HV 7  
KWWS G[ GRL RUJ

5HVHDFK \$UWLFOH

2SHQ \$F

## ,PSOHPHQWDWLRQ RI &RPSXWHU GHOLYHUHG &OLQLFDO 6HWWLQJV :KR \$JUHHV WR 3DUWLFLSDU

&XL <DQJHLGL 0 &UDLQHQ &URSMEHGL +XWHMRODQMDOL 0LFXKQGHU00J0DU\ ( 0F&DXO  
'HSDUWPHQW RI +HDOWK %HKDYLRXU DQG 6RFLHW\ -RKQV +RSNLQV %ORPEHUJ 6FKRRO RI 3XEOLF +HD  
'HSDUWPHQW RI 0HGLFLQH 8QLYHUVLW\ RI :DVKLQJWRQ 6HDWWOH 86\$  
'HSDUWPHQW RI 3V\FKLDWU\ DQG %HKDYLRXUDO 1HXURELRORJ\ 8QLYHUVLW\ RI \$ODEDPD DW %LUPLQJKD  
'HSDUWPHQW RI 3V\FKLDWU\ DQG %HKDYLRXUDO 6FLHQFHV -RKQV +RSNLQV 8QLYHUVLW\ 6FKRRO RI 0HGL  
'HSDUWPHQW RI \*HQHUDO ,QWHUQDO 0HGLFLQH -RKQV +RSNLQV 8QLYHUVLW\ 6FKRRO RI 0HGLFLQH %DOV  
'HSDUWPHQW RI 0HGLFLQH 8QLYHUVLW\ RI \$ODEDPD DW %LUPLQJKDP 86\$  
&RUUHVSRLQGLQDDXWKRL&DXO 1 %URDGZD\ 6XLWH %DOWLPRUHPDFDXCHOMKPL HGX ( PDLO  
5HFHLYHG)GDWH \$FFHSWHGSDWH 3XEOLVKHGSQDWH  
&RSULJKW <DQJ & HW DO 7KLW LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH WHUPV RI V  
XVH GLVWULEXWLRQ DQG UHSURGXFWRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DXWKRU DQG VRXU

### \$EVWUDFW

2EMHFVGHUHVVLQJ DOFRKRO XVH LQ SULPDU\ +,9 VHWWLQJV FDQ LPSURYH PHGL  
OLIH RI SHUVRQV OLYLQJ ZLWK +,9 3/:+ ,Q RUGHU WR DVVHVV WKH IHDVLELO  
LQWHUYHQWLRQ &%, DQG WR LQIRUP IXWUH HIIRUWV WR LPSURYH DFFHVV  
GHPRJUDSKLF FOLQLFDO DQG EHKDYLRUDO FKDUDFWHULVWLFV DVVRFLDWHG ZLW  
WUHDWPHQW VHHNLQJ 3/:+ ZLWK DOFRKRO PLVXVH

0HWKR3DUWLFLSDQWV ZHUH UHFUXLWHG IURP WZR &HQWUHV IRU \$,'6 5HVHDFK  
6\WHPV &1,&6 +,9 FOLQLFV 3/:+ FRPSOHWHG D FOLQLFDO DVVHVVPHQW RI SDW  
XVLQJ WDEOHW EDVHG DVVHVVPHQWV LQFOXGLQJ VRFLR GHPRJUDSKLF DQG EH  
LQGLFDWRUV L H '&' FRXQW DQG YLUDO ORDG ZHUH DOVR DYDLODEOH IURP WK  
DSSURDFKHG IRU &%, SDUWLFLSDWLRQ EDVHG RQ VFRUHV RQ WKH \$OFRKRO 8VH  
LQFHQWLYHV ZHUH RIIHUHG IRU &%, SDUWLFLSDWLRQ :H SHUIRUPHG FKL VTXDUH  
ORJLVWLF UHJUHVVLQJ WR FRPSDUH VRFLR GHPRJUDSKLF EHKDYLRXUDO DQG FO  
WR SDUWLFLSDWH FRPSDUHG ZLWK WKRVH ZKR UHIXVHG SRVWSRQHG SDUWLFLSDW

5HVXQWREVHUYHG WKDW RI QRQ WUHDWPHQW VHHNLQJ QRQ LQFHQWLYLJHG  
ZULWWHQ DJUHHPHQW WR SDUWLFLSDWH LQ RQ VLWH &%, GHOLYHUHG LQ WKHLU +  
ZKR DJUHHG WR HQURO LQ &%, KDG GHWHFWDEOH YLUDO ORDGV KHDYLU ZHHNO  
GLVRUGHU \PSWRP FRXQWV DQG PHQWDO KHDOWK \PSWRPV 1HLWKHU VRFLR GH  
ZDV DVVRFLDWHG ZLWK &%, HQUROPHQW

&RQFOXVLRQLPSOHPHQWDWLRQ UHDFKHG WKRVH SDWLHQWV PRVW LQ QHHG RI F  
DVVLVW +,9 FDUH SURYLGHUV WR EHWWHU LGHQWL\ DSSURSULDWH SDWLHQWV DQ  
RI 3/:+ LQ DOFRKRO LQWHUYHQWLRQ VHUYLEFHV

.HIZRUGV DOFRKRO PLVXVH %ULHI LQWHUYHQWLRQV IURP WUHDWPHQW PHQWDO KRIVWRKPHV RI 3/  
,PSOHPHQWDWLRQ

### ,QWURGXFWRQ

3UHYDOHQFH RI DOFRKRO PLVXVH KHDY\ ELQJH GULQNLQJ DQG DOFRKRO XVH  
GLVRUGHU LV HOHYDWHG DPRQJ SHUVRQV OLYLQJ ZLWK +,9 3/:+ HIFHOO  
FRPSDUHG ZLWK WKH JHQHUDO SRSXODWLRQ @WUHDWPHQWV LQWHUYHQWLRQ RI  
ELQJH GULQNHUV PD\ EH PRUH OLNHO\ WRPHQWKH DQG LQWHUYHQWLRQV EHKDFLQW  
DQG WKHUHE\ LQFUHDVH UDWHV RI +,9 WUHDWPHQWV IURP WUHDWPHQWV DQG LQW  
GHPRQVWUDWHG WKDW DOFRKRO PLVXVH IHWKWL\HOUHDFK WR DQG UHWUHDW  
+,9 WUHDWPHQW FDFDGH LQFOXGLQJ WUHDWPHQWV IRU LQWHUYHQWLRQV  
DFFHVVILQJ DSSURSULDWH PHGLFDO FDUH IURP WUHDWPHQWV IURP WUHDWPHQWV  
\$57 DQG \$57 QRQ DGKHUHQFH > @  
FRQWULEXWHV WR PDQ\ FRPRUELQ FRQGLVWRUWV IURP WUHDWPHQWV IURP WUHDWPHQWV  
LQFOXGLQJ D UHOXFDQFH RI SDWLHQWV





1R VRPH SDQLF DQG QR GHSUHVVLVYH V\PSWRPV				5HIHUUHQFH	5HIHUUHQFH
3DQLF GLVRUGHU RU DQG GHSUHVVLVYH V\PSWRPV					

7DEOH FRFLR GHPRJUDSKLF FOLQLFDO DQG EHKDYLRXUDO FKDUDFWHULVWLFV DQG  
UH-#RVOXPQ WRWDOV IRU VRPH YDULDEOHV BHFDSVH R\$ PLVVLQJ GDWD DQG VNLS

,QGLYLGXDOV ZKR DJUHHG WR HQURO LQ &%, UHSRUWHG KHDYLHU ZHHNO\  
DOFRKRO XVH ) S GI DQG KDG KLJKHU '60 \$8'  
V\PSWRP FRXQWV RQ WKH 0, 1, ) S GI :H  
DOVR REVHUYHG D WUHQQ WKDW D ODUJHU SURSRUWLRQ RI SDUWLFLSDQWV ZK  
DJUHHG WR SDUWLFLSDWH UHSRUWHG VHYHQ RU PRUH GULQNV RQ D W\SLFDO GD  
GULQNLQJ FRPSDUHG WR UHIXVHUV RU SRVWSRQHUV  
3DWLHQWV ZKR DJUHHG WR HQURO DOVR KDG PRUH VHYHUH PHQWDO KHDOWK  
V\PSWRPV WKDQ WKRVH ZKR UHIXVHG RU SRVWSRQHVG SDUWLFLSDWLRQ  
6SHFL}DODUJHU SURSRUWLRQ RI &%, HQUROOHUV UHSRUWHG KLJKHU VFRUHV  
RQ WKH 3+4 SDQLF V\PSWRP VFDOH LQGLFDWLQJ SUREDEOH SDQLF GLVRUGHU  
RU DQG PLOG PLOG PRGHUDWH PRGHUDWHO\ VHYHUH RU VHYHUH GHSUHVVLVYH  
V\PSWRPV RQ WKH 3+4 S )LQDOO\ D KLJKHU  
SURSRUWLRQ RI &%, HQUROOHUV KDG D GHWHFWDEOH YLUDO ORDG RQ WKHLU P  
UHFHQW ODERUDWRU\ WHVW FRPSDUHG WR WKRVH ZKR UHIXVHG RU SRVWSRQHUV  
2 S 1HLWKHU VRFLR GHPRJUDSKLF EDFNJURXQG YDULDEOHV  
L H DJH VH[ RU UDFH QRU GUXJ XVH ZHUH DVVRFLDWHG ZLWK DJUHHPHQW WR  
SDUWLFLSDWH LQ &%,

,Q WKH DGMXVWHG PRGHO 7DEOH XQGHWHFWDEOH YLUDO ORDG DGMXVWHG  
RGGV UDWLR >D25@ GHQMHUYDO >&,@ DQG  
PHQWDO KHDOWK V\PSWRPV D25 & UHPDLQHG  
PDUJLQDLOQL}FRWLQQL}FDQWRFLDWHG ZLWK &%,  
HQUROOPHQW

'LVFXVVLQR

,Q WKLV LPSOHPHQDWLRQ VWXG\ RI &%, PRUH WKDQ RI QRQ  
WUHDWPHQW VHHNLQJ 3/:+ ZLWK DOFRKRO PLVXVH DJUHHG WR SDUWLFLSDWHV  
1RWDEO\ SDWLHQWV ZHUH DSSURDFKHG LQ WKH FRQWH[W RI WKHLU UHJXODUO  
VFKHGXOHG PHGLFDO YLVLVW KDG QRW VROLFLWHG KHOS IRU WKHLU GULQNLQJ  
ZHUH QRWHG

&KDQGHURVHSKV - )OHLVKPDQ -\$ .RUWKXLV 37 \*DLVW 3 HW DO  
\$OFRKRO XVH DPRQJ +,9 LQIHFWHG SHUVRQV LQ FDUH UHVXOWV RI D PXOWL VLWH  
VXUYH\ +,9 OHG  
.HOO\ 6\* 3ODQNH\ 0 3RVW :6 /L ; 6WDOO 5 HW DO \$VVRFLDWLRQV  
EHWZHHQ 7REDFR \$OFRKRO DQG 'UXJ 8VH ZLWK &RURQDU\ \$UWHU\ 3ODTXH  
DPRQJ +,9 ,QIHFWHG DQG 8QLQIHFWHG 0HQ LQ WKH 0XOWLFHQWHU \$,'6  
&RKRUW 6WXG\ 3/R6 2QH H  
6KXS~~3U~~ -RKDUFKL 1 ,UYLQJ + 5HKP - \$OFRKRO DV D FRUHHODWH RI  
XQSURWHFWHG VH[XDO EHKDYLRU DPRQJ SHRSOH OLYLQJ ZLWK +,9 \$,'6 UHYLHZ  
DQG PHWD DQDO\VLV \$,'6 %HKDY  
9DJH~~QD~~DU 00 &RSHQKDYHU 00 6SULQJHU 6\$ 0ROLQD 3( HW DO  
H ,PSDFW RI \$OFRKRO 8VH DQG 5HODWHG 'LVRUGHUV RQ WKH +,9  
&RQWLQXXP RI &DUH D 6\VWHPDWLF 5HYLHZ \$OFRKRO DQG WKH +,9  
&RQWLQXXP RI &DUH &XUU +,9 \$,'6 5HS  
/LP -. 7DWH -3 )XOWJ 6/ \*RXOHW -/ &RQLJOLDUR - HW DO  
5HODWLRQVKLS EHWZHHQ DOFRKRO XVH FDWHJRULHV DQG QRQLQYDVLYH PDUNHUV RI  
DGYDQFHG) ~~EUHSDQ~~ +,9 LQIHFWHG FKURQLF KHSDWLWLW & YLUXV  
LQIHFWHG DQG XQLQIHFWHG SDWLHQWV &OLQ ,QIHFV 'LV