



-RXUQDO RI)RUHQVLF 3DWKRORJ\

&DVH 5HSRUW

2SHQ \$F

3BQF)PNJDJEF 'PMMPXJOH \$SJJNJOBM "CPSUJF \$BMBCBS /JHFSJB

7KHSRKLQXV ,SHKQGGJEDHJWLQ 1QROL

'HSDUWPHQW RI 3DWKRORJ\ 8QLYHUVLW\ RI &DODEDU &DODEDU 1LJHULD

&RUUHVSRRQLQJ KIDRSMKLOXV ,SHK 8JEHP 'HSDUWPHQW RI 3DWKRORJ\ 8QJYHEUFWLWLRID&DODEDU &DODEDU

5HFHLYHG-&DWH \$FFHSWHG6GSDWHPEHU 3XEOLVKHG6GSDWHPEHU

&RSULJKW 8JEHP 7, HW DO 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH WHUPV RI W
XVH GLVWULEXWLRQ DQG UHSURGXFWRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DXWKRU DQG VRXU

\$EVWUDFW

%DFNJURXGGLFDO SUDFWLWLRQHUV KDYH EHHQ DFFXVHG E\ IHPDOH SDWLHQW
XQGHUWDLQJ H[DPLQDWLRQ RQ WKHP LQ WKHLU FRQVXOWLQJ URRP ZLWKRXW FK
VDLG FDVH WKH PHGLFDO RIILFHU VXVWDLQHG D GHHS ODFHUDWLRQ WR KLV WRQJ

\$LP 2EMHFWR YGHWHUPLQH WKH FDXVH RI GHDWK RI D VHQLRU PHGLFDO GRFWRU
HYDFXDWLRQ RQ D ILUVW WULPHVWHU SULPLJUDYLG XQGHUJUDGXDWIHPDOH V
DORQH LQ KLV FOLQLF ZLWKRXW DQ DVVLVWDQFH RU D FKDSHURQH

0DWHULDQV DQGLW\WKRGKRVSLWDO EDVHG DXWRSV\ FDUULHG RXW LQ WKH 'HSDU
&DODEDU 7HDFKLQJ +RVSLWDO RQ D PHGLFDO RIILFHU ZKR GLHG RQ DUULYDO D
KRVSLWDO RQ DFFRXQW RI PDVVLYH EORRG ORVV UHVXOWLQJ IURP PXOWLSOH GH
LQMXULHV WR KLV XSSHU DQG ORZHU OLSV RU PXFRXV PHPEUDQHV ZKLOH SHUIRU
D \RXQJ XQGHUJUDGXDWIHPDOH SDWLHQW ZLWKRXW D FKDSHURQH LQ KLV SULYD

5HVXOWWKH SDWLHQW ZDV PDUNHGO\ SDOH ZLWK D GHHS ODFHUDWLRQ RQ WKH SF
ORRVHO\ E\ VL[DEVRUEDEOH FDWJXW VXWXUH ORFDWHG FP IURP WKH WLS RI KI
FP LQ GHSWK REOLT\XHO\ RULHQWHG DJDLQVW WKH OLQH RI WKH SDWLHQWV GHQ
DOWHUHG EORRG ZLWKLQ WKH WUDFKHREURQFKLDO WUHH HVRSKDJXV DQG OXQJ
DQG VKRFN NLGQH\V

&RQFOXVLRQ FDXVH RI GHDWK LV H[V DQJXLQDWLRQ VHFRRGDU\ WR WUDXPDLF
UHSDLU RI ERWK YDVFXODU DQG PXVFOH SODQHV RI WKH WRQJXH UHVXOWHG LQ I
WKH SDWLHQWV GHQWLWLRQ KHOSHG LQ OLQNLQJ KLV LQMXULHV WR WKH IHPDOH

.HIZRUGRPLFLGH 3DWLHQWV 6H[XDO DQV\XVWUHQW\OLQJ SERUWLRQRWR WKH SHUS
DQG SRVVLEO\ UHVXOWLQJ LQ GHQWLWLRQ
,QWURGXFWRQ PDMRULW\ RI UHSRUWV LV RQ WKH YLFWLP

\$ERUWGRQDQV WKH WHUPLQDWLRQ RI XQDOWHG SUDFWLWLRQW WKH IRRQG
LV D FULFLOD 1LJHULD SXQLVKDEOH E\ D PHGLFDO SUDFWLWLRQW WKH IRRQG
\$ERUWLRQ LV SUDFWLWLRQ LQ VHFUHF\ E\ D PHGLFDO SUDFWLWLRQW WKH IRRQG
ODERUDWRU\ VFLHQWLWV DQG HYHQ PHGLFDO VFXGHQWV LQGHQDULYDQJ LQ
RI ZRPHQ XQGHUJRHV D ' & SHUIRUPHG D FKHPLW\ ZKHUH WKH DOZD\ H[DPL
WUDGLWLRQDOHSORRYHQR\ @QLQWHQJHG SUDFWLWLRQWV LQGHQDULYDQJ DQ
XQVDIH DERUWLRQ FRQLQXW WR EH K\WKH IHPDOH SDWLHQWV LQ WKH WKH
PLOORQ LQGXFHG DERUWLRQV LQ GRFXPHQW HGXLYDQJ WR D UDWIWKH
DERUWLRQV SHU ZRPHQV DQW ERUWHFHQW DJHQF\ 6H[XDO DVVDXOW
DUH VHULRXV FRPSOLFHWLRQ VXFK DV XWHULOH SUDFWLWLRQWV LQ GHQWLWLRQ
HYHQ GHDWK RI WKH ZRPHQ 8Q VDIH DERUWLRQV LQ GHQWLWLRQWUHQV
WKH FRXQWU\ DV KLJK OHYOV RI PDW\H DQW GHDWK RQ XOWRWLQWLRQV LQ
\$ERUWLRQ ODZ DQG SROLF\ OLEHUDOLYDQJ RQ SUDFWLWLRQV LQ GHQWLWLRQ
DERUWLRQ DQG >UHQV\GHQDQWV D V\WUHQV\ RQ WKH YLFWLP OHVV WKDQ
PHGLFDO LQ FDUULHG RXW WKH SURFHGXU\ DORQ LQ GHQWLWLRQV LQ WKH
IDFLWLRQV LQ GHQWLWLRQV P\VVHULRXV ODFHUDWLRQV LQ GHQWLWLRQV LQ WKH
WR PDVVLYH EOHGLQJ OHGGLQJ WR KLV FDXVH SURSADQJLQJ DQW WKH IHPDOH
DJUHHG WKDW IHPDOH YLFWLRQV LQ GHQWLWLRQV LQ GHQWLWLRQV LQ WKH
FRPSOHWLRQ RI D UDSH DWWHPSW > @ 6XFK UHVLVWDQFH PD\ UHVXOW LQ VHYH

