



" \$POTFDVUJWF 4FSJFT PG BMM 4VCUZQFT PG 1BUJFOU "ENJUUF UP BO "DBEFNJD \$SPPOBSZ

+RRUZHJ \$- *UXQGHNHQ 0-' 9DQ GH +RHI 73 +HQULTXHV -36 3HWHUV 5-* 3LHN -- GH :LQWHU 5- %DDQ \$0& +HDUWFHQWHU \$FDGHP LF 0HGLFDO &HQWHU 8QLYHUVLW\ RI \$PVWHUGDP 7KH 1HWKHUODQGV &RUUHVS RQGLQDD&WKROU 9LV \$0& +HDUWFHQWHU \$FDGHP LF 0HGLFDO &HQWHU 8QLYHUVLW\ RI \$PVWHU 1HWKHUODQGV 7HO)D[(PDLO P P YLV#DPF XYD QO 5HFHLYHG6&SWHPEHU \$FFHSHWG6&SWHPEHU 3XEOLVKHG&DREHU &RSULJKW +RRUZHJ \$- HW DO 7KLV LV DQ RSHQ DFFHVV DUWLFH GLVWULEXWHG XQGHU WKH WHU XQUHVWULFWHG XVH GLVWULEXWLRQ DQG UHSURGXFWLRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO D

\$EVWUDFW
2EMHFLLWV\OH LV NQRZQ RI WKH LQ KRVS LWDO PDQDJPHQW DQG RXWFRPHV RI \$&6 SDWLHQWV DGPLWWHG WR DQ DFDGHP LF FRURQDU\ FDUH XQLW && :H WK KRVS LWDO PDQDJPHQW DQG FRPSOLF DWLRQV LQ DQ XQVHOHFWHG \$&6 FRKRUV
0HWKRGV DQG ,QHWKOWUHWURVSHFWLYH REVHUYDWLRQDO FRKRUV VWXG\ ZH SDWLHQWV GLYLGHG LQ VXEJURXS RI 67VHJPHQW HOHYDWLRQ P\RFDUGLDO 167(0, Q DQG XQVWDEOH DQJLQD 8\$ Q DGPLWWHG WR RXU && \$Q LQ RI \$&6 SDWLHQWV 67(0, 167(0, 8\$ S 167(0, SDWLHQWV Z VFRUH ! FRPSDUHG WR " ZHUH OHVV IUHTXHQW\ WUHDWHG ZLWK SHUFXWDQH S DQG PRUH IUHTXHQW\ ZLWK FRURQDU\ DUWHU\ E\SDV JUDIWLQJ & 2YHUDOO LQ KRVS LWDO PRUWDOLW\ ZDV DW GLVFKDUJH IURP WKH && DQG UHVSHFWLYHO\ ,Q KRVS LWDO UH LQIDUFWLRQV RFFXUUHG LQ VW RI SDWLHQWV 0DMRU DGYHUVH FDUGLDF DQG FHUHEURYDVFXODU HYHQWV 0\$& (HYHQWV 1\$& (LQ \$JH IHPDOH JHQGHU SUHYLRXV VWURNH DQG FKURQLF NL ZLWK KLJKHU RQH \HDU PRUWDOLW\
&RQFOXVLRQFRQVHFXWLYH DQG XQVHOHFWHG \$&6 FRKRUV FRPSULVHG 67(0, 8\$ SDWLHQWV ,QGHSHQGHQW RI \$&6 VXEW\SH DQG *5\$& (ULVN VFRUH DERXW RI VWUDWHJ\ \$JH IHPDOH JHQGHU SUHYLRXV VWURNH DQG &.' ZHUH DVVRFLDWHG ZL

.H\ZRUGVFXWH FRURQDU\ \IQQGURPH \$FFHSHWG6&SWHPEHU 3XEOLVKHG&DREHU DQDWKRSK\VLR &RURQDU\ FDUH XQLW *5\$& (ULVN VFRUH DERXW RI \$&6 VXEW\SH DQG *5\$& (ULVN VFRUH DERXW RI SUHYHQWLRQ ,Q KRVS LWDO PDQDJPHQW DQG FRPSOLF DWLRQV LQ DQ XQVHOHFWHG \$&6 FRKRUV
FDUGLDF ELRPDUNHUV \$&6 KDV EHHQ F HOHYDWLRQ P\RFDUGLDO LQIDUFWLRQ 67 P\RFDUGLDO &RURQDU\ 167(0, DQG XQV %\SDV\MDVLQ\$* &RURQDU\ \$QJLRJUDSKV O&DWK QDENQRZQ RI WKH LQ KRVS LW &DWKHHWULJDWLRQ /DERUDWRU\ && &RURQDU\ &DUH SDWLHQWV 1 Z&RQV DQVW KUH ,QGXFHG 1HSKURSDWK\ &.' &KURQLF DQGLW\HGHWRHRQ&3&6&HFW FRURQDU\ F 3DLQ 8QLW &9' &DUGLRYDVFXODU 'LVHIDUJHFW\$37LVLDFV \$QLRSDVSLWDO PDQDJ HUDS\&* (OHFWURFDUGLRJUDP (' (RUVHIDUJHFWH\$6&PFRURW 2XU REVHU H*)5 HVWLPDWHG *ORPHUXODU)LOWUDWRQ\$5DWLH*5&ULHOREIDSDWLHQWV ZLWK RI \$FXWH &RURQDU\ (YHQWV KV7URS7 DQGLW\HGHWRHRQ&3&6&HFW XVO45DW RQH ,QWHUTXDUWLOHVSQ&HULRSJ 'HVFHQGLQJ \$&6&LJQDWRUWKH URXWH RI \$&6 SDWL \$GYHUVH &DUGLDF \$QG &HUHEURYDVFXODU DQGLW\HGHWRHRQ&3&6&HFW ZKLFH &OLQLFDO (YHQWV 167(\$&6 1RQ 67 6HJPHQW LQIDUFWLRQ P\RFDUGLDO &RURQDU\ 6IQQGURPH 167(0, 1RQ 67 6HJPHQW (OHYDWLRQ 0\RFDUGLDO ,QIDUFWLRQ 3&, 3HUFXWDQHRY &RURQDU\ ,QWHUYHQWLRQ 6' 6WDQGDUG 'HYLDWLRQ 67(0, 67 VHJPHQW (OHYDWLRQ 0\RFDUGLDO ,QIDUFWLRQ 7,\$ 7UDQVLHQW ,VFKHP LF \$WDFN 8\$ 8QVWDEOH \$QJLQD 6WXG\ SRSXODWLRQ

,QWURGXFWRQ ,Q WKLV UHWURVSHFWLYH REVHUYDWLRQ RQVHFXWLYH \$&6 SDWLHQWV DGPLWWHG LQ DFDGHP LF DVFXODU VSHFWLYH 8&6H 167(0 LVFKHP LF GLVHDVHV ZLWK SRWHQWLDO DQG VHYHFRURQDU\WKH GLVFXODUJH GHDWK \$OWKRXXK FOLQLFDO SUHVHQW SDWLHQWV WKH GLVFXODUJH UHFRUG RI WKH SDWLHQWV ZLWK \$&6 GEDJ

&LWDWHRG UZJHJ \$- *UXQGHNHQ 0-' 9DQ GH +RHI 73 +HQULTXHV -36 3HWHUV 5-* HW DO
\$FXWH &RURQDU\ 6\QQURPH 3DWLHQW \$GPLWWWG \$WKR HDQR \$FDGHP 2.5 HCR \$RFDWM &DUH 8

3DJH RI

VHJPHQW HOHYDWLRQ DFXWH FRURQD BUWDQGW RGHdD1Z7(U\$&5ROZHFVHG DW
FODVW\HGSDWLHQW EDVHG RQ WKH D\URPOV EKH(X&LFLSDG 3MURSRQDQ5HFRUGV
3DWLZLQV\ HOKY\DKHQV\WVRSR QKORSURP 6HFRQGDUI\ HQGSRLQWV LQFOXGHG WKH I
RWKHU FRQGLWLRQV ZHUH H[FOXGHG

%DV HFKLDQDFVZHURHAWDILBONHGHFLQLFFDRU GY H URXWH RI \$&6 SDWLHQWV WR RXU
GHWDLOHG OLVW RI WIGH\EDLWHDRQGH FRXDUQGLVWHLV WLFV GHVWLDQDHLR 8 DGPLVLRQ ZHUH UHJLVWHU
2QOLQH \$SSHQGL[\$ RI VWDI RQ WKH &&8 ,Q KRVSLOWO HYHQV

6HWWLQJ

LVVWXG\ ZDV SHUIRUPHG DW DQ DFD \$&6 RQ \$&8 \$&8 HPLVFKHJGLFD RXU LQVWLW
&HQW\ 8QLYH\ \$PWWHU B DAWKHU, DQDQG QZDLWLQJ IRU 3&, RU &\$%* LH LI D FRPS
ODVW\HU W HDWLHWR VSKUFXWDRUHRQ\WHUYH KWSLW\HGH\ QKRVSLWDO WUDQVIHU WR D UI
3&, DQDG VIE WUHGVLXDFJ HJFLO \$WLLKWL RHWKH R ORQJHU FRQVLGHUHG DQ LQ KRVSLOWO
UHJLVWV BMDLQDRO R ODUWHNSDJVUVI &\$%*)RU FRPSRVLWH HGG SRU QWZ HW BNXR-HCO RO
ZLWKRXW YDOYH YR DQ QNDZD 3& a YROX E HTPLEJ QRW UHG B\OHDGFR R GLSQ* WZD WK
RI ZKLFK a SULPDU\ 3& , WKH +25,=216 \$0, +DUPRQLJLQJ 2XV

: H DWIHEHGQH Q SUH (&RWSLWDBVZRWKH 5HYDVFXODULJDWLRQ DQG 6WHQWV LQ \$FX
GLDJORVLDV\LNEDVRHQK B *DQSKIVFRPSOD \$&7< \$FXWH &DWKHWHULJDWLRQ DQG
WKH SDWLHQW LV SUH WUHDWHG LQ DPEWDDWH\ZLW@ LWLWDOYHQXV WKH SDUQ KR
,8 DQGX DQWLS WDKWH ODSW DQGXURXJWKH EOHGGLQJ DFFHVV VLWH KHPRUUKDJH UH
FDWKHWHULJDWLRQ ODERUDWRU\ FDWV UHPEWHQWFKH PWR PLO DAV JYKH V\KPF W X
\$VHWLP 3UXQFRPS BZFRDSHGHGDUHWVQWRUGH BSR I a PPRO O JGO ZLWK DQ RYH
UHIHUULQD KIRY SUKROXUV REVHUYDWLRQ FRPSRXU a && PPRO WDEHG GO ZLWKRXW DQ
67(0, SDWLHQWV KDYH ORQJHU REVHUY BWHRQWRQRXB &E OHHGGLQJ RU WKH XVH
ZLWK WKH H[FOXVLRQ RI &\$%* UHODWHG E

3DWLZLQV\SHRWH \$SDUJH WWRQVFKHSDWLQSO, LQYHVWLJDWRUV ZH DOVR UHSRUWHG
XQLW &38 'XWFK c(HUVVH +DUW +XO \$&\$%*)HGHGHG EOHGGLQJ R B\W DQGHU
HYDOXDWH B \$D KWD\GLWFKUHEHWZLHWHQ 15YHQWV 0\$&&(FRPSULVHG LQ KRVSLOW
DQ\$ > @ \$ UHSKURVSDOEDHMYBHS S URUW UH LQIDUFWLRQ DQG VWURNH ZLWKRXW
QRUPDO wj BRQLWL QRWHEGHOHYDMHCOOVY \$&(ZBWHQBQ WKH FRPSRVLWH RI LQ KR
EHWZHHQDQG wj OODWPHWHVH VZ RQSHUHYLBY MRU EOHGGLQJ QRW UHODWHG WR &\$%*
QRQKRVOR ZHLRGLGH WHEZVU BQ QWVRDQ S\KHUH
KRXOD \$HURVH B D LFRQVLWUHGHYDQGH SVHWUDWLEFDRQLR QH DU P B WODIDVGRZV
PDN WGLDJQR B V\LOLNH HXVHYDOXH wj O DZKLFK ZHUH DVVRFLDWHG ZLWK KLJKHU RQ
DEVROXWR V \H DU VXUYLYDO *HGGHU ZDV UHODWHG W
RQH \H DU PRUWDLW\ DQG VXUYLYDO LQ D

3DWLZLQV\HLDJQZLW\H67 (\$SDUHXEPLWVWKH
&&8DQV UH DWHG 7DQDQWLFRRD R ODUWHRQH DWD DQDO\VLV
JXLGH\LOH YDULVNRVW W DQ BWF XUPRIQDU GLDO
LQIDUEW D BXXOLW\K \$&(*OR B EOL RV \$FXWH &RQLQXRXV YDULDEOHV ZHUH FRPSDUH
&RURQD H QWLVFRJH V B B OHHGGLQJ LQ KHYDULDQFH \$129\$ DQG WKH LQGHSHQGH
&586\$'(&DSD SUGV WUDWB BMDRQSDH LHG W\WULEXWLRQ RU WKH .UXVNDQ :DOOLV
6XSSUSHY MURK WFRZLW\DUOPSOHPH R W DMLRQHZHG GLVWULEXWLRQ &DWHJRULFDO I
\$&& \$+\$ JXLGHOLQHV EOHGGLQJ ULVN VFRW\H B KL VTXDUH WHVW 2QH \H DU PRU
DSODQ OHLHU PHWKRG \$OO WHVWVQZ\HFDQ
HFKR WSHUIB QEKHL PRQD LQDSSUVHDFK LIS @ E 6WDWLVLWLFDO DQDO\VLV
XUJFRWR ODU LRJUS\$SK\ KRX H DUC\$ LI S @ E 6WDWLVLWLFDO DQDO\VLV
KRXUV RU &\$* KRXUV ZLWK RU ZLWKRXW %D G KRF 3&, a LQ 167(\$&6
SDWLZLQV\WLVH URWVHQRV HSKLVQ EIDDVH V K H
JXLGHOLQHV > @ 5HVXOWV

(QGSRLQWV

%DVHOLQH FKDUDFWHULVWLFV

UH SLPDQGSZBOW VSHRPHUHG WPHDW \$S\WRWDO RI SDWLHQWV ZHUH DGPLWV
GXULQJ WKH FXUUHQW KRVSLOWO DGPLVLRQ RQ ZLW R \$&6 EHVZHPW\DO LW\ DQG
RQH \H DUW DOW W HDWPH H QWVQD VLVQPHRGLFD 67(0, 167(0, DQG H B B DQW
WUHDWPHQW RQ\ RU DQ LQYDVLVH VWDWV DQV \$Q LQDUMLY ZLW WUDWH RI ZKHI SDW
VSHFLDQSRQO &&\$%DQGHYDVFXODULJDWLRQ, SDWLHQWV ZHUH \RXQJ\XV DQGHSDH R V
DQG RU \$&6 D WPHQW VWUDWHJLVH ZHUH FRPSRUYHG EAVZHHYHQW KFRVSDUHG WR
*5\$&(ULVN VFRUH RQ DGPLVLRQ IRU E C RWSLWDB QGN B RZHG W B Q K L K H V W S U
WR LQWHUPH \$S B WFRQMN 167(\$SDWLHQV GLDEHWHV PHOOLWXV LQ WKH 8\$ JUR

&LWDWLRQ RQZUZHJ \$- *UXQGHNHQ 0-' 9DQ GH +RHI 73 +HQULTXHV -36 3HWHUV 5-* HW DO
 \$FXWH &RURQDU\ 6\QGURPH 3DWLHQW \$GPLWWHG WR DQ \$FDGHPLF &RURQDU\ &DUH 8

3DJH RI

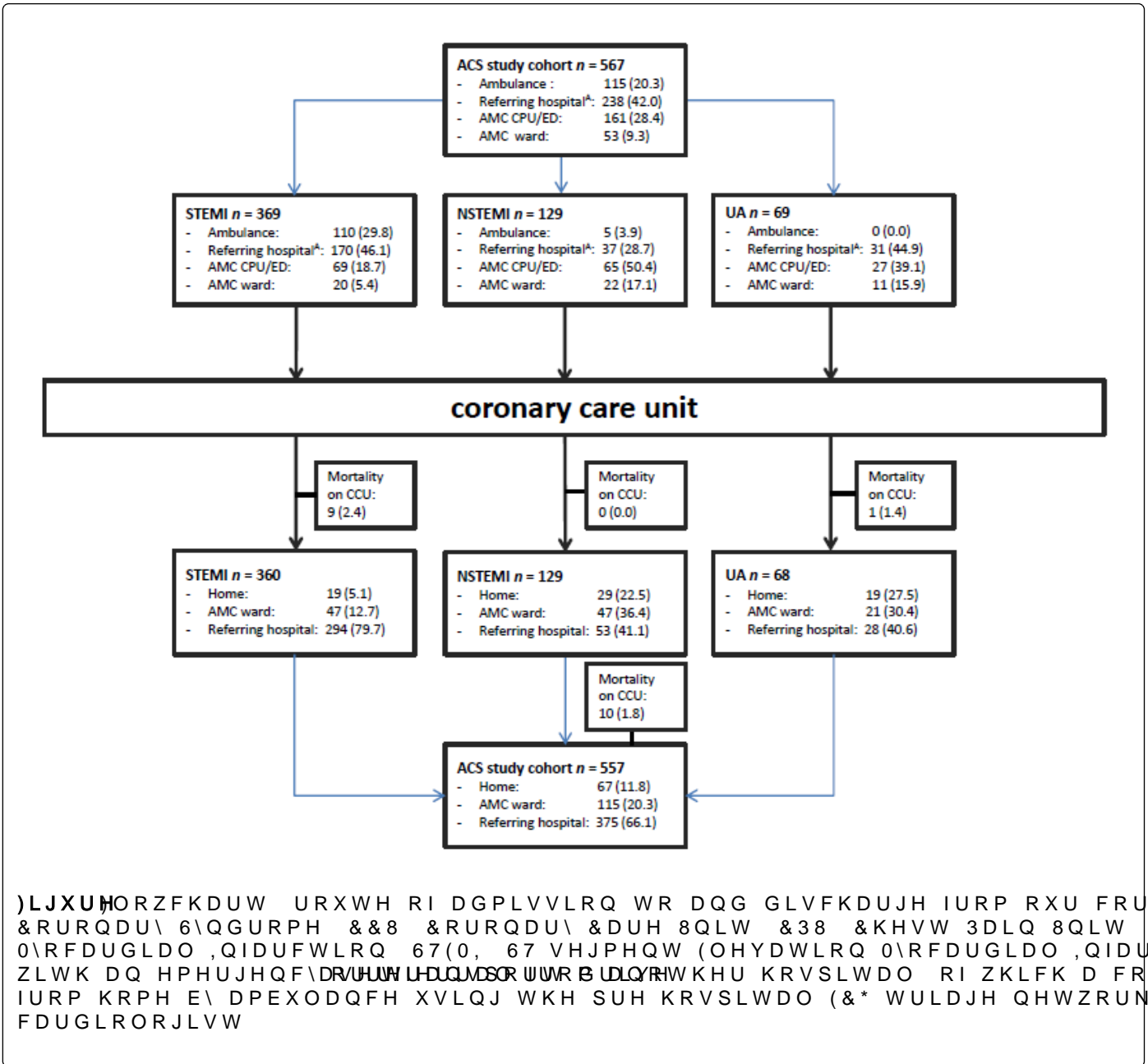
	\$&6 VWXG\ FRKRUV	67(0,	167(0,	8\$	3 YDOXH
	Q	Q	Q	Q	
3DWLHQW FKDUDFWHULVWLFV					
\$JH \HDUV ± PHDQ " 6'	"	"	"	"	
ODOH JHQGHU ± Q					
&DUGLRYDVFXODU PHGLFDO KLVWRU\					
&DUGLDF\$SDWLHQW					
0\RFDUGLDO LQIDUFWLRQ ± Q					
3&, ± Q					
&\$%* ± Q					
\$WULDO ILEULOODWLRQ ± Q					
3HULSKHUDO YDVFXODU GLVHVV ± Q					
6WURNH 7,\$ ± Q					
&DUGLRYDVFXODU ULVN IDFWRUV					
3DVW DQG FXUUH\QW VPRNHUV					
'LDEHWHV PHOOLWXV ± Q					
+ \SHUWHQVLRQ ± Q					
)DPLO\ KLVWRU\ IRU &9' ± Q					
+ \SHUFKROHVWHUROHPLD ± Q					
%0± PHDQ " 6'	"	"	"	"	
&KURQLF NLGQH\GLVHVV					
H*)5 PO PLQ ± Q P					

7DEOH% DVHOLQH FKDUDFWHULVWLFV \$&6 \$FXWH &RURQDU\ 6\QGURPH\H\%R' %RG
 &DUGLRYDVFXODU 'LVHVV H*)5 HVWLPDWHG *ORPHUXODU)LOWUDWLRQ 5DW
 3HUFXWDQHRXV &RURQDU\ ,QWHUYHQWLRQ 6' 6WDQGDUG 'HYLDWLRQ 67(0, 67
 \$WDFN 8\$ 8QVWDEOH \$QJLQD \$ &DUGLDF SDWLHQW D SDWLHQW ZLWK RQH R
 Q 67(0, Q 167(0, RU Q 8\$ & 0LVVLQJ IRU Q \$&6 Q 67(0, Q
 GLVHVV FKURQLF NLGQH\ GLVHVV PHQWLRQH LQ WKH PHGLFDO RQ VORU G D Q
 FXUHQW DGPLVLRQ RSDUWPHQW ZLWK WKH GLVHVV HTXDWLRQ

5RXWLQJ RI SDWLHQWV

WKH DPEXODQFH SHUVRQQHO DQ 38 KRHH
 HPHUJHQF\ GHSDUWPHQW VKRFN URRP Z
 IRU RI \$&6 SDWLHQWV DQG DQRWKHU
 \$&6 SDWLHQWV
 \$&6 SDWLHQWV LQ RXU UHJLRQ
)LJXUH }VKQH RI \$&6 SDWLHQWV FDPH GLUHFVO\ IURP KRPH
 E\ DPEXODQFH 0RVW \$&6 SDWLHQWV +HPRZHQDQWV SDUWPHQW 0RVW \$&6 SDWLH
 &&8 E\ DPEXODQFH ZLWK DQ HPHUJHQF\ RSDUWPHQWV RUHW DG\FXODUJ DWLRQ LQG
 IURP DQRWKHU KRVSLOWO RI ZKLFK D URRP QDWXUH 3DURV RUWLSRQ SDWLHQWV
 SDWLHQWV ZDV DFWXDOO\ WUDQVIRUURQ PGEU DFWXODQFH ZHUPH ZEDLWPHQW DQDFW
 XVLQJ WKH SUH KRVSLOWO (& WULDJHZHUW DGPLWZLWK EHRQDXXCHRWLRQHEHVKZHH

\$WKHURVFOHU 2SHQ \$FFHVV DQ RSHQ DFFHVV MRXUQDO 9ROXP k ,VVXH k



)LJXUH\HORZFKDUW URXWH RI DGPLVLRQ WR DQG GLVFKDUJH IURP RXU FRURQDU
 &RURQDU\ 6\QGURPH &&8 &RURQDU\ &DUH 8QLW &38 &KHVW 3DLQ 8QLW (' (P
 0\RFDUGLDO ,QIDUFWLRQ 67(0, 67 VHJPHQW (OHYDWLRQ 0\RFDUGLDO ,QIDUFWLR
 ZLWK DQ HPHUJHQF\DRUHUW L\DUU\SRUWR B\DU\RWKHU KRVS LWDO RI ZKLFK D FRQVLG
 IURP KRPH E\ DPEXODQFH XVLQJ WKH SUH KRVS LWDO (& * WULDJH QHWZRUN ZLW
 FDUGLRORJLW

7UHDWPHQW RI SDWLHQWV

(OHFWLYH 3&, FRPSOLFDWHG E\ \$&6 DFFRXLQW\IRXUHQW DGPLVLRQ LQ
 SDWLHQWV 2QO\ SDWLHQWV 67(0, FRPSDUW\SRZQ IURP 167(0, DQG
 LQWHQVLYH FDUH XQLW WR RXU &&8 S 7DEOH 167(0, DQG 8\$ SD
 OHVV IUHTXHQWO\ UHYDVFXODULJHG 3&, D SDWLHQWV ZDV S KRXU\$ KLJKHU SURSRU
 LQWHUTXDUWLOH UDQJH ,45JL}FRUHQWV ZLW SDWLHQWV ZHUH UHYDVFXODULJ
 DGPLVLRQ IRU 67(0, SDWLHQWV PHGLDQ 67(0, SRXUHQWV 45 S KRXU\$5\$&(ULVN
 S PRVWO\ DZDLWLQJ IRU WUDQVIRU WR DRWKHU KRVS LWDO &RURQDU\ &DUH 8QLW
 UHKDELOLWDLRQV LQ 67(0, DQG 167(\$& 167(0, DQG 8\$ SDWLHQWV PDQDJ
 8\$ S 7DEOH DQG)LJXUH LQYDVLYH VWUDWHJ\
 +LJK ULVN *5\$&(VFRUH ! 167(0, S
 FRPSDUHG WR ORZ WR LQWHQVLYH

&LWDWLRQ UZJHJ \$- *UXQGHNHQ 0-' 9DQ GH +RHI 73 +HQULTXHV -36 3HWHUV 5-* HW DO
 \$FXWH &RURQDU\ 6\QQGURPH 3DWLHQW \$GPLWWHG WR DQ \$FDGHPLF &RURQDU\ &DUH 8

3DJH RI

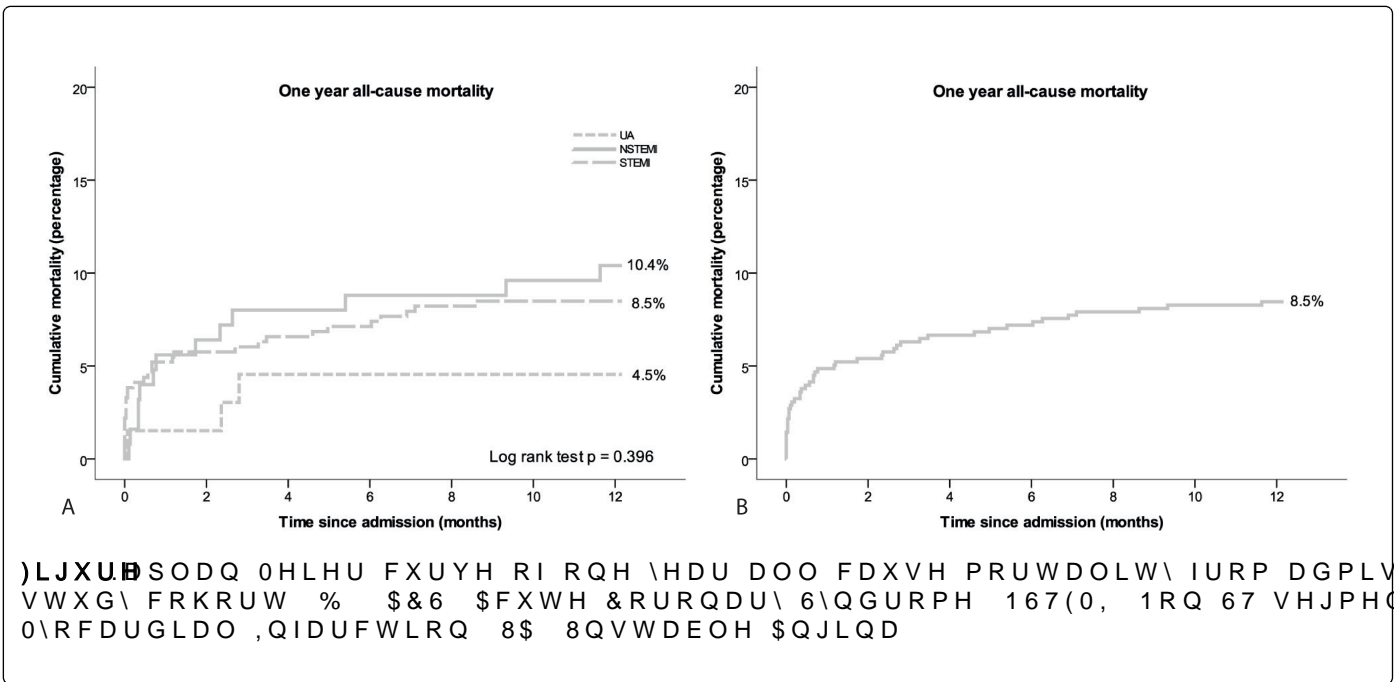
SDWLHQWV ZHUH OHVV IUHTXHQWO\ YUHDWHG ZLWK 8\$, SDWLHQWV ZLWK
 S DQG PRUH IUHTXHQWO\ ZLWK 167(0, 1RQ 67 VHJPHQW (O
 S +LJK ULVN SDWLHQWV HOSGRG 8\$% KDYH PRUH

	\$& VWXG\ FRKRUW	167(0,	8\$	3 YDOXH
	Q	Q	Q	Q
'XUDWLRQ RI VWD\ RQ &&8 KRXUV ±	PHGLDQ ,45			
7UHDWPHQW VWUDWHJ\				
OHGLFDO WUHDWPHQW RQO\ ± Q				
,QYDVLV VWUDWHJ\ ± Q				
&\$* RQO\ ± Q				
3&, ± Q				
&\$%* ± Q				
5HYDVFXODULJDWLRQ ± Q				

7DEOH KRVSLWDO WUHDWPHQW \$& \$FXWH &RURQDU\ 6\QQGURPH RWRQ\$% \$QRUQDU\
 &RURQDU\ &DUH 8QLW ,45 ,QWHUTXDUWLOH 5DQJH 167(0, 1RQ 67 VHJPHQW (O
 ,QWHUYHQWLRQ 67(0, 67 VHJPHQW (OHYDWLRQ 0\RFDUGLDO ,QIDUFWLRQ 8\$ 8QV

&OLQLFDO RXWFRPHV

ORUWDOLW\ DW GLVFKDUJH IURP WKH +RFRZDKDJLF DQGU DNH KRZSLWKHO FDXVH
 GLVFKDUJH LW ZDV 7DEOH DQG YLHXBHQDW&RVRM RUHLQWFRMSW WLOO WKH
 GHDWK ZHUH FDUGLDF IDLOXUH LQ SDWERYHU 167(0,RWK 67(0,SDW 8\$ QV 67(0,
 FDUGLDF IDLOXUH FRPELQHG ZLWK D FRPHU PRDULDFOLWR FZVLQ SDWUHQWLQJ
 67(0, DQG FDUGLDF IDLOXUH FRPELQHG ZLWK DFRWVW LIQ 67(0,SDWLHQWV ZDV
 167(0, DQG LQ 8\$ SDWLHQWV S



)LJXUB SODQ 0HLHU FXUYH RI RQH \HDU DOO FDXVH PRUWDOLW\ IURP DGPLVVLRQ
 VWXG\ FRKRUW % \$& \$FXWH &RURQDU\ 6\QQGURPH 167(0, 1RQ 67 VHJPHQW (O
 0\RFDUGLDO ,QIDUFWLRQ 8\$ 8QVWDEOH \$QJLQD

H LQ KRVSLWDO UH LQIDUFWLRQ UDVLQIDUFWLRQ QS @UHDVQ MKRFZOLRQ V7DEOH
 FODVVLFRUGLQJ WR WKH}QKRUFRGFDYHGU 167(0, DQG 8\$ SDWLHQWV
 KRVSLWDO DGPLVVLRQ S %OHHGLQ

\$WKHURVFOHU 2SHQ \$FFHVV DQ RSHQ DFFHVV MRXUQDO 9ROXP k ,VVXH k

&LWDWLRQ UZHZJ \$- *UXQGHNHQ 0-' 9DQ GH +RHI 73 +HQULTXHV -36 3HWHUV 5-* HW DO
\$FXWH &RURQDU\ 6\QGURPH 3DWLHQW \$GPLWWHG WR DQ \$FDGHPLF &RURQDU\ &DUH 8

3DJH RI

RI SDWLHQWV ZLWK DFFHVV VLWH EOHHS DWLHQWV UHVSROK KRVS LWDOP R\$Y
RI WKHP ODMRU EOHHGLQJV QRW UHQDWHG WR R\$%&R FDXWUHQW LQWJFKDQ
RI SDWLHQWV &\$%* UHODWHG QLFROUHQWUHQWUHQWUHQW WKH VXEJURXSV
FRPPRQ LQ 167(0, FRPSDUHG WR 67(0, DQG 8\$

	\$&6 VWXG\ FRKRUW	167(0,	8\$	3 YDOXH
	Q	Q	Q	Q
,Q KRVSLWDO RXWFRPHV				
2Q &&8 DOO FDXVH PRUWDOLW\ ± Q				
,Q \$0& DOO FDXVH PRUWDOLW\ ± Q				
5H LQIDUFWLRQ ± Q				
6SRQWDQHRXV W\SH ± Q				
6HFRQGDU\ WR LVFKHPLF LPEDODQFH W\SH ± Q				
3&, UHODWHG W\SH D ± Q				
,Q VWHQW WKURPERVLV W\SH E ± Q				
&\$%* UHODWHG W\SH ± Q				
6WURNH 7,\$ ± Q				
%OHHGLQJ ± Q				
&DXVH				
\$FFHVV VLWH ± Q				
)HPRUDO KHPDWRPD • FP ± Q				
)HPRUDO FP RU EUDFKLDO UDGLDO ± Q				
&\$%* UHODWHG ± Q				
*DVWUR LQWHVWLQDO ± Q				
1RQ JQDVWUR LQWHVWLQDO ± Q				
6HYHULW\				
:LWK • PPRO O +E GURS ± Q				
:LWK EORRG WUDQVIXVLQ ± Q				
ODMRU EOHHGLQJ QRQ &\$%* UHODWHG ± Q				
ODMRU EOHHGLQJ LQFOXGLQJ &\$%* UHODWHG ± Q				
0\$&&(± Q				
1\$&(± Q				
GD\ RXWFRPH				
\$OO FDXVH\$PRQWDOLW\				
2QH \HDU RXWFRPH				
\$OO FDXVH\$PRQWDOLW\				

7DEOH OLQLFDO RXWFRPHV \$&6 \$FXWH &RURQDU\ 6UDQVUHQW &\$%RQRURQDU\ 8\$Y
ODMRU \$GYHUVH &DUGLDF DQG &HUHEURYDVFXODU (YHQWV 1\$&(1HW \$GYHUVH
,QIDUFWLRQ 3&, 3HUFXWDQHRXV &RURQDU\ ,QWHUYHQWLRQ 67(0, 67 VHJPHQW
8QVWDEOH \$QJLQD \$ 0LVVLQJ IRU Q \$&6 Q 67(0, Q 167(0, RU Q 8\$

\$WKHURVFOHU 2SHQ \$FFHVV DQ RSHQ DFFHVV MRXUQDO 9ROXP k ,VVXH k

Stratification E\ RQH \H DU PRUWDOLW\ LQFRUSRUDWHG LQ WKH *5\$&(VFRUH LQ F
\$&6 SDWLHQWV GHFHDVHG DW RQH ZLWK KLJK RYHUDO UDWHV BI 3&, DQG &\$
VLJQL}FRDQ\ ZLWK VWDQGDUG GHYLDWLRQ SDWLHQWV DZLWKVD *5\$&(\VFRUH
ZLWK 6' \H DU SRVHG HPRUH YRXU SRSXODWLRQ ZHUH OHVV IUHTXHQW
S FRPSDUHG WR WKRVH DOLYH JURXS %QWOKZROLF &6%QH QHQ OLVDVH FRKR
&.' ZDV PRUH FRPPRQ LQ JURXS \$ DOVR PRUH \$UHTXHQWO\ SHUIRUPHG LQ O
ZDV D SULRU VWURNH YV S > @ %H L J H O Y H W Y P O V W U D W F B Q F O X G H G W
JURXS \$ YV JURXS % S VWURQ J U S Y H V G L F O V R U L J B W K R Q G H M D L N O F R U H Q
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)XUWKHUPRUH ZRPHQ DQG PHQ KDG V E L L O D D S H U F V H Q D W E V S H U R U P E D W & \$ % * L C
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H FXUUHQW XQVHOHFWHG \$&6 SRSXODWLRQ DGPLWWHG WR RXU DFDGHPLF
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&38 ZLWK D PD[LXP REVHUYDWLRQ W D B H R U V K R X U Z H U P U H D P L W K H E D W H G
WR D ZDUG 2Q WKH RWKHU HQG 67(0, SDWLHQWV ZLWK D Q L G M D W Y H Q V F R U H Q D E
RU WKRVH FRPLQJ LQWXEDWLRQV W K U L F K M U S L Q R X Q G R I J R Q W J H Y D V F X O D U L J D W L R Q C
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H PDLQLRU WKLV REVHUYDWLRQDO V R X Q K L H G L D W R Q V G L F S D Q D H W R P V L Q I H F
\$&6 VXEWISH DQG *5\$&(ULVN VFRUH K E K K W R Q H R H B B W R H O W D O Z W U J D W H V L Q
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DERXW ZHUH VLPLODU I H O P R K U W D O L Z R X W E R N K S V D Q G D Q L Q G H S H Q G H Q W S U H G L
DUH FRPSDUDEOH ZLWK WKH OLWHUDWPRUWDOLW@ L O S W K S D J K L H Q W R X Y F R @ R S W U
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& ' V W D J H V > @ 67(0, SDWLHQWV WUHDV
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LQVLJKW LQWR PDQDJHPHQW SUDFWLFHV 5 H D V R Q V D U H K H P R G Q D P L F L Q V W D E L O L W \

*5\$&(ULVN VFRUH FRQVHTXHQFH RI WKSURJ, DQ VRLXUN DFDGHPLQPHQD
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PHGLDQ *5\$&(VFRUH EXW DOVR PRUH Q G L D G Y D E R Q J H R X U L Q U L X N D R Z Q R & Y S O D F
3&, DQG VWURNH 7,\$ FRPSDUHG WR R W K R Q 4 6 7 (N L G Q H & 8 Q M @ D Q H W R & , 1 P D
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+YHOS \$XDQD WLDX DG VHQ 0 5DVPXVVHQ -1 5DCHXYD\WDRQ DFXWH FRURQDU\ V\QQGURPH UH
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%XVFK 69 -HQVHQ 6(JHQR)WQEHU3UH YHQWLI
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FRQVHUYDWLYH VWUDWHJLHV IRU XQVWDSEHF XVDQDQBXV FRURQDU\ UHOLHVDH VVWUHDVLRQ
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\$OIUHGV&QD\DRQDQ)R[)\$HGULNVVWUHD 5DQGRPLJHG WULDO FRPSDULQJ VDPH GD\ GU
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.RFK 37HN GH :LQWHU 5- 'DYLQ * . 0XOGHU
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+XDQJ \$ODP+DPJH, KLUDGHLVZ \$OHW DO 3SDWLVHQWV HDUO\ WR WKH WUHQV UHQ DWR UQS
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*ROGHQEHUJ, DRDNR 9LQDR VXDHW DO 5HODWLRQ
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