

# Primary Trauma Care Manual



**n]vsx?**

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tyf

Marcus W. Skinner



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**A Manual for Trauma Management**

**In District and Remote Locations**

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## kl/ro

ljZjsf ;a} b]zx¿df rf]6k6ssf 36gfx¿ ;'Ggdf kfOG5 . cljst; b]zx¿df ;8s tyf cf}wf]lus rf]6k6ssf 36gfx¿ pNn]Vo dfqdf kfOG5 / o;sf] d'Vo lzsf/ o'jfx¿ ePsf] b]lvG5 . zL3| Pj+ k|efjsf/L lrlsT;f ;jfaf6 rf]6k6ssf 36gfaf6 pTkGg x'g] ;d:of tyf d[To'x¿nfO{ w]/} xb;Dd sd ug{ ;lsG5 .

o; rf]6k6ssf] k|fylds :ofxf/ kf7\oqmdsf] d'Vo p2]Zo To:tf la/fdLx?sf] klxrfg tyf pkrf/ ug{ **cfjZos 1fg / zLkx?** k|bfg ug{ / tTsfm klxrfg, Resuscitation / rf]6k6s nfu]sf c+ux?nfO{ l:y/tf k|bfg ug{ ' x] . Hofg hf]lvddf kg{;Sg] laz]if cj:yfx¿sf] zL3| klxrfg / pkrf/sf] cfjZostfnfO{ o; lzlffn] ljz]if hf]8 lbPsf] 5 .

;}4flGts 1fg / Jojxf]s zLk dfkm{t rf]6k6ssf] ;j}dfGo Joj:yfkg ;DalGw cfjZos 1fg k|bfg ug{tkm{ of] kf7\oqmd nllft 5 . h;sf] cfwf/df **lrlsT;s / :jf:YosdL{x¿n}** hl6n k|lqmof / pks/Of lagf rf]6k6s Joj:yfkg] sfo{ ug{ ;Sb5g\ .

rf]6k6ssf] Joj:yfkg] af/]df y'k]} sf];{ / lgb]{lzsfx¿ kfOG5g\ h:t} American College of Surgeons (ALTS™) Course / EMST Australian lgb]{lzsf h;n] rf]6k6s Joj:yfkg] lgs} k|efjsf/L / ;+ul7t lzlff k|bfg ub{5 . o:tf k':tsf tyf lgb]{lzsfx¿ d'Vo?kdf ;'ljwf;DkGg c:ktfndf sfo{/t :jf:YosdL{x¿tkm{ nllft /x]sf 5g\ / logLx¿sf kf7\oqmd (Syllabus) a[xt vfnsf 5g\ . o; rf]6k6ssf] k|fylds :ofxf/ kf7\oqmd tL cGo lgb]{lzsf jf k':tsfnfO{ k|lt:yfkg ug{ geO{ ltg} cfwf/e't l;4fGtsf] k|of]u u/L Go'gtd ;|f]tx¿sf] pknAwtfdf rf]6k6ssf] cfwf/e't pkrf/ ug{ tof/ kfl/Psf] x] .

## p2]Zox¿

o; kf7oqmdsf] ;dfIKt kl5 k|lzlffyL{x? lgDg s'/fx¿ ug{ ;lfd x'g]5g\ .  
-!\_ rf]6k6s Joj:yfkg] k|fyldstfx? a'e\mg .  
-@\_ l56f] / ;xL tl/sfn] rf]6k6sdf k/]sf JolQmx¿sf] cfjZostf klxrfg ug{ .  
-#\_ rf]6k6s nfu]sf JolQmnfO{ Resuscitate tyf l:y/ (Stabilise) ug{ .  
-\$\_ cfkm" sfo{/t :jf:Yo s]Gb]÷c:ktfndf rf]6k6s :ofxf/ ;DalGw cfjZos Joj:yf s;/L ug{] eGg] af/] yxf] kfp]g .

## rf]6k6ssf] kl/k]llo

ljZjdf xfn w]/} b]zxčn] rf]6k6ssf] dxfdf/L v]Kg' kl//x]sf] 5 t/ ljsf;f]Gd'v b]zxčdf o:tf 36gfx? cfZro{hgs 9+un] a[l4 eO/x]sf] 5 . af6f]3f6f]sf] lgdf{0f / ;jf/L ;fwgsf] k|of]un] b'3{6gf / d[To'sf] ;+VofxčnfO{ a9fO lbPsf] 5 / xfn pknAw lrlsT;f ;]jf k|bfos ;+:yfxčdf ;jf/L b'3{6gf / cGo eljtJodf k/]sf] lj/fdLxčsf] rfk a9\bf] dfqfdf kfOG5 . xfn ulfdL0f / zx/L b'j} efudf u+eL/ tl/sfn] kf]n]sf 36gf x'g' klg ;fdfGo alg;s]sf] 5 .

wgL / ul/a b]zxč aLr ljBdfg c;dfgtfxčn] ubf{ klg k|fylds rf]6k6saf/] pkrf/ kf7\oqmd ljz]if lsl;dn] ljsf; ug'{ pko'Qm b]lvG5 . d'Vo čkdf tn plNnlvt s'/fxčsf cfwf/df o:tf kf7\oqmdxčsf] ljsf; ul/G5 .

- 3fOt] JolQmxčnfO{ lrlsT;f ;]jf lbg n}hfg'kg]{ b'/L
- lrlsT;f ;]jf k|fKt ug{ nfUg] ;do
- pRr k|ljlw / pks/0fxčsf] cefj
- blf hgzlQmsf] sdL

rf]6k6s Joj:yfkgsf] cToGt ;:tf], ;'ne / ;'llft pkfo eg]sf] rf]6k6ssf] /f]syfd ug'{ xf] . of] sfo{ d'Vo čkdf To; 7fpFsf] ;]ft / cGo tTjxxčdf lge{/ x'G5 .

h:t} M

- ;+:s[l
- hgzlQm
- /fhgLt
- :jf:Yo lf]qsf] ah]6
- tflnd

rf]6k6s lgoGq0f ug]{ k|of; ubf{ lrlsT;f 6f]nLn] dfly pNn]lvt tTjxč ljrf/ u/L sfo{ ug'{kb{5 . w]/} sfo{xč of] lgb]{lzsfsf] lf]q aflx/sf 5g\ / tL sfo{xč :yfgLo kl/l:ylt / cfjZostf cg';f/ cfkm" :jo+n] g} lgwf{/0f ug'{kb{5 .

## rf]6k6skl5 d[To' x'g]xčsf] tYo

- %)Ü JolQmx¿ s]lx ldg]6leq db{5g\ -6fpsf] / /Qm gnLdf rf]6k6s nfUgfn]\_ .
- #%Ü JolQmx¿ !-@ 306fdf db{5g\ -5ftL, k]6 / 6fpsf] 3fF6Ldf rf]6 nfUgfn]\_ .
- !%Ü JolQmx¿ Ps xKtfd f db{5g\ -c+usf] sfo{ c;lfdtf, cËeË x'gfn]\_ .

## rf]6k6ssf] A-B-C-D-E

u+eL/ lsl;dsf rf]6k6ssf] Joj:yfkg ug{ d'Vo ħkdf To;sf] **Aoj:yfkg sfo{sf] k|fyldstfsf] :ki6 klxrfg** x'g' h?/L 5 / o;sf] nlo la/fdLsf] hLjgnfO r'gf}lt lbg] rf]6k6sx?sf] k|f/IDes n]vfhf]vf ug'{ xf] . l7s 9+un] ul/Psf] **k|f/IDes lg/Llf0fn]** Hofg hf]lvddf kg{;Sg] rf]6xċ t'?Gt kQf nufpg ;lsG5, h:t} M

- Zjf;gnLsf] cj/f]w
- 5ftLsf] rf]6 ;fy} Zjf;-k|Zjf; ;DalGw sl7gfO{x?
- u+eL/ cfGtl/s jf jfx\o /Qm>fj
- k]6df nfu]sf 3fp÷rf]6xċ

**olb Ps eGbf a9L 3fOt] JolQmxċ ePsf] v08df hl6ntf / hf]lvdtfsf cfwf/df k|fyldstf 5'6\ofO{ pkrf/ ug'{k5{ (Triage) . o:tf] sfo{ cg'ej / ;|f]tdf e/ k5{ . -o; af/] k|of]ufTds ;qdf 5nkmn ul/g]5 . \_**

ABCDE (Airway, Breathing, Circulation, Disability and Exposure) lg/Llf0f klxnf] cfjZostf xf] . of] sfo{ @-% ldg]6 leq ul;/Sg' k5{ . olb cToGt hl6n / zL3] pkrf/ ug'{kg}{ cj:yf ePdf k|fylds lg/Llf0f;Fu} pkrf/ klg cl3 a9fpg'kb{5 . o;df lgDg plNnlvt sfo{x? kb{5g\ .

### Zjf;gnL (Airway)

**Zjf;gnLsf] n]vfhf]vf M la/fdLn] ;f; lng / af]Ng ;S5 ls ;Sb}g < olb Zjf;gnLdf cj/f]w 5 eg]-**

- lrpF8f] p7fpg]÷a+uf/f prfNg] (jaw thrust ) -lha|f] aËf/df hf]l8Psf] x'G5 . \_
- Suction ug]{ - olb pknAw ePdf \_
- Guedel airway / Nasopharyngeal airway
- Intubation M o;sf nflu la/fdLsf] 3fF6LnfO{ xnrn gu/fO{ /fVg'kb{5 .



## Zjf; -k|Zjf; (Breathing)

la/fdLsf] Zjf; k|Zjf; ls|ofsf] hfFr ug'{xf];\ . olb k"Of{z kdf :jf; -k|Zjf; lqmf eO/x]sf] 5}g eg] M

- Decompress -kmf]S;f] leqsf] rfk sd ug]{\_ tyf drainage u/L Tension pneumothorax -5ftL leq xfjfsf] rfk a9\g]\_ ÷haemothorax -kmf]S;f] leq /ut hDdf x'g]\_ af6 xfjf jf /ut lgsfNg]]
- 5ftLdf ePsf] v'Nnf 3fpxz pkrf/ u/L aGb ug]{ .
- s[lqd tl/sfn] ;f; km]/fpg] (Ventilation)

**olb pknAw ePdf cIS;hg lbg'xf];\**

## /Qm; +rf/ (Circulation)

cIS;hgsf] dfqf, Zjf;gnL / Zjf; k|Zjf;sf] dfqfsf] lg/lfOf ul;/s]kl5 /Qm; +rf/sf] n]vfhf]vf ug'{kb}5 . o;sf nflu lgDg sfo{xz ug'{kb}5 .

- afIx/L /Qm>fj /f]Sg'xf];\ .
- olb ;Dej ePdf 14 jf 16 gauze sf] needle n] @ j6f I.V. fluid ;'rf? ug]{ .

## c;lfdtf (Disability)

zL3| :gfo' ;DaGwL (Neurological) n]vfhf]vf ug'{xf];\ (s] la/fdL ;r]t 5, b'vfO{df dfq k|ltlqmf u5{ jf k"Of{tof cr]t 5 <) . ;dosf] sf/Ofn] o:tf] cj:yfdf Glasgow Coma scale sf] k|of]u ug{ g;lsg] x'Fbf, lgDg s'/f c]nDag ug'{xf];\ .

;r]t (Awake) - A

cfjfhdf k|ltls|of (Verbal response) - V

b'vfO{df k|ltls|of (Painful response) - P

s'g} k|ltls|of gb]vfpg' (Unresponsive) - U

AVPU System of] cj:yfdf :ki6 / l56f] x'G5 .

**olb lj/fdLsf] cj:yf ulDe/ ePdf ABC sf] k'gM n]vfhf]vf**

## Exposure -la/fdLsf] n'ufx? vf]n]/ z/L/ v'Nnf kfg]{

la/fdLsf] sk8f vf]n]/ **rf]6 5÷5}g x]g' {xf];\** . 3f6L jf d]b08sf] rf]6  
eP la/fdLnfO{ xnrn ug{ glbO{ l:y/ (In – Line Immobilisation) kfg' {xf];\ .  
of] k|of]ufTds ;qdf 5nkmn ul/g]5 .

---

**gf]6\; M**

## Zjf; gnLsf] Joj:yfkg (Airway management)

Zjf;gnL ;'rf? /fVg' pkrf/sf] klxnf] k|fyldstf xf] .

!\_ la/fdL;Fu af]Ng'xf];\

:ki6;Fu af]Ng ;Sg] la/fdLsf] Zjf;gnL ;'rf? /x]sf] x'G5 . cr]t la/fdLsf] nflu cfjZostf cg';f/ s[lqd ZJff;k|Zjf; oGqsf] k|of]u ug'{k5{ . olb 6fpsf], 3fF6L jf 5ftLdf rf]6 5 eg], oGqsf] k|of]u ubf{ Cervical spine sf] ;'/lff ug]{ Joj:yf ldnfpg'k5{ . cr]t JolQmdf d'Vo?kdf lha|f]n] Zjf;gnLdf cj/f]w pTkGg u/fPsf] x'G5 .

@\_ olb ;Dej ePdf, :jtM km'Ng] Jofu cyjf df:s (Rebreathing Mask) k|of]u u/L clS;hg lbg'xf];\ .

#\_ Zjf;gnLsf] hfFr ug'{xf];\ .

Zjf;gnLdf cfpg] cj/f]wsf nlf0fx? lgDg x'G5g\ M

- 3'/]sf] h:tf] cfjfh lg:sg'
- (Stridor) ;f; km]bf{ c;fdfGo cfjfh lg:sg'
- Agitation (hypoxia) clgolGqt tl/sfn] la/fdL rNg'
- Zjf; tfGgsf] nflu ;xfos df+zk]zL k|of]u ug'{ / 5fltsf] rfn c;fdfGo (paradoxical) x'g' – 5ftL km'Nbf rf]6 nfu]sf] efu leq hfg]
- Zf/L/ lgnf] x'g' (Cyanosis)

Affx\o j:t'af/] ;ts{tf ckgfpg'xf];\ . Zjf;gnL ;'rf?ug]{ lalwx? cg';"rL ! df k|:t't ul/Psf] 5 / o;nfO{ k|of]ufTds ;qdf ;dLlff ul/g]5 . o:tf] cj:yfdf IV sedation -lgGb«f nfUg] cf}ifwL\_ lbg x'Fb}g .

\$\_ Zjf;gnLsf] pRr Joj:yfkg]sf] cfjZostfaf/] ljr/ ug'{xf];\ .

lgDg cj:yfx?df Advanced Airway Management ljlwåf/f Zjf;gnL ;'rf? /fVg'kb{5 .

- Zjf;gnLsf] cj/f]w gx6]df
- 3fF6Ldf /ut hDg'sf ;fy} 3fF6L 5]l8P/ rf]6 nfu]df
- Zjf; k|Zjf; aGb ePdf
- Hypoxia
- 6fpsf]df ulDe/ rf]6 nfu]df
- 5ftLdf rf]6 nfu]df
- Maxillofacial injury -d'v / a+uf/fsf] rf]6k6s\_

Zjf;gnLsf] cj/f]wsf] t'?Gt pkrf/ ug'{kb{5 .

## Zj; k|Zj;sf] Joj:yfkg (Breathing Management)

3fOt] JoIQmsf] pkrf/df Zj;-k|Zj; Joj:yfkgnfO{ bf];|f] k|fyldstf /flvG5 .

-!\_ Zj;-k|Zj;sf] ultnfO{ **IgofNg'xf];\** (LOOK) / tn plNnlvt dWo] s'g} 5 eg] x]g'{xf];\

- Z./L/ lgnf] x'g' (Cyanosis)
- Zf/L/ 5]8\g] 3fp
- Flail Chest -5ftL km'nfpFbf rf]6 nfu]sf] efu gkm'Ng]\_
- Sucking Chest Wound -5ftLdf ePsf] 3fpn] Zj; k]mbf{ x]f] leq tfGg]\_
- ;xfos df;k]zLsf] k|of]u

-@\_ Palpation (FEEL) **5fDg'xf];\**

- Trachea cfkmgf] :yfgaf6 ;/]sf]
- eflRrPsf] s/Ē (Broken ribs)
- 5fnf d"lg af];f]sf] efusf] ODkmfO;]df (Subcutaneous emphysema)
- Haemothorax / Pneumothorax sf] kl/lf0fsf] nflu Percussion ug'{xf];\ .

-#\_ Auscultation (LISTEN) ;'Gg'xf];\

- Pneumothorax -rf]6 nfu]sf] 7fpFdf Zj;-k|Zj;sf] cfjfh sd ;'lgG5 )
- 5fltdf c;fdfGo cfjfhx? Klxrfg ug'{' .

## Resuscitation lqmof

of] ljifo k|of]ufTds cWofon] ;d]6\b5 . -cg';"rL % df x]g'{xf];\\_

- Zj;k|Zj;df cj/f]wx; b]vf kl//x]df **5fltsf] PS;-/] (X-Ray) ug'{' cufl8 g}** Pleural Cavity df hd]sf] x]f] / /ut k|fyldstfsf ;fy intercostal drainage 6\o'a k|of]u u/L lgsfNg'k5{ .

- olb Zjf;gnLdf 6\o'a /fVg'kg]{ l:y|t b]lvG5 t/ 6\o'a /fVg ;lsPg eg] Coricothyroidotomy ljlwaf6 klg ;f]e}m ug{ ;lsG5 . -cg';"rL ! x]g'{xf];\ \_

## Wofg k'¥ofpg'kg]{ s'/f

- ha;Dd JolQmsf] cj:yf l:y/ x'Fb}g, pknAw eP;Dd 3fOt] JolQmnfO{ clS;hg lbO/xg'xf];\ .
- olb Tension Pneumothorax sf] z+sf ePdf bf]>f] Intercostal Space sf] Mid Clavicular Line af6 Large Bore Needle l5/fpg'xf]; / hd]/ a;]sf] xfjf x6fpg'xf];\ . Intercostal Tube g/fv'Gh]n;Dd ;f] Needle glemSg'xf];\ .
- olb Ps jf b'O{k6s;Dd k|of; ubf{ klg Zjf;gnLdf 6\o"j /fVg (Intubation) ;lsPg eg] Coricothyroidotomy sf] nflu k|fyldstf lbg'xf];\ . of] sfo{ ug{ laz]if ;dfu|L tyf cg'ejL :jf:YosdL{sf] cfjZostf kb{5 . To;}n] w]/} 7fpFx?df of] sfo{ ug{ ;Dej gx'g ;S5 .

la/fdLnfo{ Zjf; km]/fpg] sfd 5f]8]/ Intubation ug]{ sf]lz;

## /Qm;+rf/ Joj:yfkg (Circulatory Management)

tj>f] k|fyldstf kof{Kt /Qm;+rf/sf] :yfkgf ug{' xf] .

Shock eGGffn] cËsf capillary bed df ckof{Kt /St;+rf/ / tGt' (Tissue) df sd clS;hgsh] cj:yfnfO{ hgfpFb5 . 3fOt] JolQmdf of] hypoalaemia sf] sf/Ofn] al9 dfqdf b]lvG5 .

Shock **sf] lgbfg** Clinical Findings **sf] cfwf/df ul/G5 M**

/Qmrk sd x'g', gfl8sf] ult a9\g', Zjf; k|Zjf;sf] ult a9\g', z/L/sf] tfks|d sd x'g', Pallor, xftv'6\6f lr;f] x'g', capillary refill -g<sup>a</sup> lyRbf @ ;s]G8 leq /ftf]kgf b]lvG]\_ sd x'g', lk;fa sd x'g' -cg';"rL # df x]g'{xf];\_

Shock **ljleGg k|sf/sf x'G5g\ M**

-!\_ Haemorrhagic/hypovolaemic Shock **M** o;sf] d'Vo sf/Of /ut cyjf t/n kbfy{ cTolws dfqdf z/L/af6 aflx/ hfg' xf] . rf]6 nfu]kl5 v]/ uPsf] /utsf] dfqsf] n]vfhf]vdf lgs} sd Wofg lbOG5 / cem v'Nnf 3fp gePsf] v08df t jf:tf g} ul/Fb}g . t/ ofb /fVg'xf];\ M

- w]/} dfqdf /ut Abdominal tyf Pleural Cavity df hd]sf] x'g';S5 .
- It3|fsf] xf8 eflRrFbf @ ln6;/Dd /ut v]/ hfg;S5 .
- sDd/sf] xf8 eflRrFbf @ ln6/eGbf a9L /ut v]/ hfG5 .

-@\_ Cardiogenic Shock **M** o;sf] d'Vo sf/Of d'6'sf] sfo{ c;lfdtf xf] / o;sf] sf/Of lgDg 5g\ M

- Myocardial contusion -d'6'sf] df+zk]zLdf rf]6\_
- Cardiac tamponade -d'6'nfO{ jl/kl/af6 5f]Kg] kqleq /ut hDg'\_
- Tension pneumothorax (h;n] /ut d'6'tkm{ hfgaf6 /f]Sb5\_
- d'6' 5]8\g] ulx/f] rf]6 nfUg'
- Myocardial infarction -Åbo3ft\_

o:tf] kl/l:y|tx?df Jugular Venous Pressure sf] n]vfhf]vf cfjZos kb{5 / olb pknAw ePdf ECG ug{' kb{5 .

-#\_ Neurogenic Shock **M** o;sf] sf/Of Spinal cord sf] rf]6 xf] h;n] ubf{ Sympathetic tone x/fpF5 . o:tf] cj:yfdf Reflex tachycardia jf Skin Vasoconstriction lagf g} /Qmrk sd x'G5 .

**-\$** Septic Shock : of] rf]6k6ssf] z'?sf] cj:yfdf b]lvFb}g t/ 3fOt]sf] xKtf lbg k5f8L d[To' ePdf of] g} d'Vo sf/0f -ljleGg cËsf] sfo{ aGb eO{ x'G5 . d'Vo ?kdf k]6sf] 5]8\g] vfnsf 3fp / 89]sf]÷kf]n]sf] lj/fdLdf ;+qmd0fsf] sf/0fn] ubf{ of] ;d:of a9L b]lvG5 .

**Hypovolaemia Ps Hofg} hfg ;Sg] cfktsfnLg cj:yf xf] To;}n] o:nfO{ tTsfn klxrfa u/L pkrf/ ul/a' kb{5 .**

## Circulatory resuscitation

o;sf] d'Vo p2]Zo tGt'x?df kof{Kt dfqfdf clS;hg k'¥ofpg' xf] .

/ut v]/ hfg' d'Vo ;d:of ePsf], Fluid k'g:yf{kfg ug'{ g} k|fylds / cfjZos sfo{ xf] .

- Zf/L/df kof{Ktdfqfdf /Qm;+rfng x'g' cfjZos x'G5 . o;sf nflu sDtLdf b'O{j6f 7"nf cannula (14-16 G) /QmgnL leq l5/fpg'kb{5 . slxn]sfFxL xft jf v\$fdf sf6]/ /QmgnL km]nfkfg'{ kg]{ cj:yf klg cfpg ;Sb5 .
- /QmgnLaf6 lbg] fluids (Crystalliods e.g. N/saline as first line) z/L/sf] tfkqmd;Fu ldNg] u/L Gofgf] agfpg' -dg tftf] kfgL ePsf] afN6Ldf /fv]/\_ kb{5 . ofb /fVg'xf]; hypothermia n] /ut hDg] k|s|ofdf u8a8L ug{ ;S5 .
- Glucose ePsf emf]nx? k|of]u gug'{xf];\ .
- k|of]uzfnf hfFrsf nflu / crossmatch ug{sf] nflu cfjZos kg]{ /Qmgd'gfx? ;+sng ug'{xf];\ .

## Ikzfa (Urine)

Circulation reserve sf] ;+s]tsf] ?kdf lk;fasf] dfqfnfO{ gfKg'xf];\ . lk;fasf] dfqf )=% ld=ln=÷s]=hL=÷306f eGbf a9L x'g'k5{ . cr]t lj/fdLsf] nflu lk;fa km]/fpg Urinary catheter sf] cfjZostf kb{5 .

## Blood Transfusion

/ut kfg lgs} sl7g kg{;S5 . /ut gldNg] ;d:of, x]k6fOl6; aL (Hepatitis B) tyf P8\; (AIDS) h:tf ;Defljt ;d:ofx?nfO{ Wofgdf /fVg'xf];\ .

/QmgnLaf6 fluid lbFbflb+b} klg la/fdLsf] /Qm ;+rf/df cl:y/tf (haemodynamic instability) b]lvPdf Blood transfusion ug'{ kb{5 . olb ldNg] ;d'xsf] / cross match u/]sf] /ut gkfOPdf O Negative ;d'xsf] /ut (Packed RBC) k|of]u ug'{kb{5 . olb Haemoglobin sf] dfqf 7 g/dl eGbf sd 5 / lj/fdLsf] /ut alu/x]sf] v08df Blood transfusion ug]{ sfo{nfO{ ulDe/tf"}j{s lng' kb{5 .



## k|yd k|fyldstf – /ut aUg /f]Sg'xf];\

- **xftv'šfsf] rf]6k6s M** Tourniquets -rf]6 nfu]sf] c+usf] dfly afFWg]\_ sf] k|of]u /fd|f] x'Fb}g . pN6f] o;n] cj/f]w ePsf] /Qm;+rf/ k'gM ;+rfngdf b]lv]g] nlf0fx? (reperfusion syndromes) / rf]6 nufpg ;Sb5 . o;sf nflu Pressure dressing ug'{kb{5 . ulx/f] 3fp cyjf sfl6Psf] c+uaf6 eO/x]sf] ulDe/ /Qm>fjnfO{ subfascial gauze pack sf] k|of]uaf6 ;fy} Proximal Artery nfO{ xftn] lyr]/ / rf]6nfu]sf] c+udf ;fjwfgLk"}j{s compressive dressing u/] /f]Sg'kb{5.
- **5ftLsf] rf]6k6s M** 5ftLsf wdgLx?af6 d'Vo ?kdf /Qm>fj x'G5 . tTsf] Chest tube drain /fVg'sf ;fy} ;do ;dodf suction ug]{ / k|efjsf/L analgesia (IV Ketamine) sf] k|of]un] kmf]S;f] expansion ug{'sf ;fy} /Qm>fj /f]Sb5 .
- **k]6sf] rf]6k6s M** olb IV fluid lbFbf klg Systolic blood pressure 80-90mm df cfPg eg] hlt;Sbf] l56f] Damage Control Laparotomy ug'{kb{5 . o;sf] d'Vo p2]Zo k]6 leqsf] /ut hfg] :yfgx?df gauze pack u/L aGb ug'{ xf] / To;kI5 mid line incision nfO{ #) ldg]6leq towel clamp n] c:yfoL ?kdf aGb ug'{kb{5 . DC Laparotomy ZfNols|of geO{ Ps pkrf/ k|lqmf of xf] h'g lhNnf txdf tflnd k|fKt 8fS6/ jf g;{n] Ketamine anesthesia k|of]u u/L ug{ ;Sb5g\ . of] ljwL k|of]u ug{ la/fdLsf] cjnf]sgsf] ug{'kb{5 / olb ;xL tl/sfn] ul/Pdf Hofg hf]ufpg ;S5 .

**/ut v]/ hfg' rf]6k6s nfu]sf lj/fdLdf Shock x'g] d'Vo sf/0f xf] .**

## bf];|f] k|fyldstf M Fluid k'g:yf{kgf ug{' , Gofgf] kfg{' / Ketamine analgesia lbg'

- **la/fdLnfO{ lbg' cuf8L t/n kbfy{ Gofgf] kfg{' kb{5 M** zl//df k|fs[lts ?kdf /ut hDg] k|lqmf #\*=%) ;] df /fd|f];Fu x'G5 . z/L/sf] tfkqmd #%) ;] eGbf sd ePkl5 haemostasis ug{ ufx|f] kb{5 . pi0f k|b]zLo lf]qdf klg rf]6sf] sf/0fn] 3fOt] JolQmsf] z/L/sf] /utsf] tfkqmd lgs} 36\5 . la/fdLnfO{ lr;f] agfpg ;lhnf] x'G5 t/ p;sf] z/L/sf] tfkqmd a9fpg lgs} ufx|f] kb{5 . o;}sf/0fn] ubf{ z/L/sf]] tfkqmd 36\g lbg'x'Fb}g . z/L/df /QmgnLaf6 lbO{g] t/n kbfy{x? (Per Oral & IV fluids) \$)-\$@) ;] ;Dd tfks|dsf] dfq k|of]u ug{'kb{5 . sf]7fsf] tfks|dsf] t/n kbfy{ lbg' eg]sf] la/fdLnfO{ lr:ofpg' ;/x xf] .

- **Hypotensive fluid resuscitation** **M** **olb** haemostasis  $c;'/llft / clglZrt ePdf,$  Systolic blood pressure  $*)-( ) dL=dL= ;Dd /xg] u/L$  fluid  $sf] dfqf$   $lgoGq0f ug\{ 'kb\{5 .$
- **Colloid Solution** **Out - Electrolyte solution**  $in! xfn\} ePsf lrlsT;f$   $cg';Gwfgsf cg';f/ w]/\} /Qm>fj ePsf la/fdLdf$  colloid Solution  $-h:t\}$   $x]dfi;n_ n] electrolyte$   $-h:t\}$   $gd\{n ;nfO\{g / l/+u/NofS6\}6_$   $3f]nsf] t'ngfndf s]lx gsf/fTds c;/x? b]vfPsf] 5 .$
- **Gag reflex**  $ePsf] t/ k]6sf] rf]6 gePsf] lj/fdLsf nflu d'vaf6$   $emf]nkbfy\{ lbg' ;'/llft Pj+ k|efjsf/L x'G5 . d'vaf6 v'jfOg] emf]n$   $kbfy\{df lrgL / nj0fsf] dfqf sd x'g'kb\{5. a9L dfqfdf lrgL jf nj0f$   $ePsf] emf]n kbfy\{n} cfGb|fdf a9L dfqfdf$  fluid  $tfGb5 h;n]$   $la/fdLdf gsf/fTds c;/ kfb\{5 . u]8fu'8Lsf] emf]n jf lunf] u/L$  **agfOPsf] vfgf**  $la/fdLnfo\{ v'jfpg /fd|f] dflgG5 .$
- **Analgesic**  $sf] 5gf\}6 M$  **Ketamine**  $n] inotropic effects$   $b]vfpg'sf ;fy\} /$  **Gag reflex**  $df s'g\} c;/ gkfg]\{ x'Fbf )=@$   $mg/kg$  **IV** **repeated dose**  $df ;a\}$   $lsl;dsf] rf]6k6ssf] pkrf/sf nflu k|of]u ul/G5 .$

**cfkm\gf] ;'/lffsf] Vofn ug'\{xf]; M 3fOt] :jf:YosdL\{**

## **;xfos lg/lf0f (Secondary Survey)**

la/fdLsf] ABC l:y/ ePkl5 dfq Secondary Survey ul/G5 .

olb o; cj:yfdf s'g} u8a8L ePdf Secondary Survey nfO{ /f]sL k'gM  
Primary Survey ug'{kb{5 . ;a} u/]sf sfo{x? n]v]/ /fVg'kb{5 . s;/L  
n]Vg] eGg] s'/f 5nkmndf NofO{g] 5 .

lz/b]lv kfp;Ddsf] hfFr u/L lgDg s'/fx? ljz]if?kdf gf]6 ug'{kb{5 M

### **!= 6fpsfsf] hfFr**

- 6fpsfsf] 5fnf (Scalp) / cfFvfsf (Ocular) c;fdfGo cj:yfx?
- sfgsf] hfnL / aflx/L efux?
- cfFvf jl/kl/sf g/d tGt'x?sf 3fpx?

### **@= 3fF6Lsf] hfFr**

- 5fnf 5]l8Psf Pj+ 3f]lrPsf 3fpx?
- 5fnf d'lg xfjf el/g' (Sub cutaneous emphysema)
- Zjf; gnLsf] :yfg kl/jt{g x'g' jf ;g'{ (Tracheal Deviation)
- 3fF6Lsf] lz/f (Vein) b]lvv'

### **#= :gfo' (Neurological) sf] hfFr**

- Glasgow Coma Scale (GCS) sf] cfwf/df dl:tsn] ug]{ sfdsf] n]vfhf]vf ug'{  
-cg';"rL \$ x]g'{xf];\\_  
• ;'ifDgfaf6 hfg] ;Gb]zx?sf] sfo{ (Spinal cord motor activity)
- r]tgf / k|ltlf]k lqmoxf? (Sensation & reflex)

### **\$= 5fltsf] hfFr**

- Clavicles / s/Ësf ;j} xf8x?
- Zjf; k|Zjf;sf cfjfhx? / d'6'sf] w8\sg
- pknAw ePdf O=;L=hL= (ECG)

**cGo cj:yf k|df]0ft geP;Dd 6fpsf]df rf]6k6s nfu]sf  
lj/fdLx?nfO{ uw{gsf] :gfo'df klg rf]6 nfu]sf] 5 egL z+sf**

**%= k]6sf] hfFr**

- k]6df 3f]lrPsf] jf 5]l8Psf] ulx/f] rf]6 nfu]sf] eP zNolqmf of ug'{}kb{5 .
- Blunt Trauma df Nasogastric Tube 6\o'a /fVg' kb{5 . -cg'xf/df rf]6 ePdf g/fVg]\_
- dnåf/sf] hfFr
- Urinary Catheter k|of]u ug'{}kb{5 . -d'q gnLdf Sofy]6/ k;fpg' eGbf klxnf /ut cfP gcfPsf] hfFr ug'{}kb{5 . \_

**^= sDd/ / xft v'§fsf] hfFr**

- Fracture 5 sL x]g'{}xf];\
- Peripheral Pulse hfFRg'{}xf];\
- sf6]sf] 3fp, rf]6k6s jf cGo eP x]g'{}xf];\

**&= PS;-/] (X-Ray) -;Dej ePdf / cfjZos k/]df\_**

- 5fltsf] X-Ray / uw{gsf xf8x?sf] PS;-/] (Cervical spine films) df uw{g sf & j6} xf8x? b]lv g'{}kb{5 \_
- Pelvic tyf nfdf xf8x?sf] PS;-/]
- 6fpsfsf] PS;-/] -6fpsf]sf] rf]6df :gfo' ;Dj]Gw s'g} ;d:of gb]lvPtf klg PS;-/] ug'{} kmnbfoL x'G5 lsgls o;af6 6fpsf]sf] xf8 ef+IRrPsf] eP yxf x'G5.\_
- cfjZostf cg';f/ c? PS;-/] ug'{}xf];\ -NB k|fylds lg/Llf0fsf] qmddf 5flt tyf Pelvis sf] PS;-/] sf] cfjZostf kg{ ;S5 . \_

|  |
|--|
| <p><b>gf]6M leq nfu]sf] rf]6k6ssf] ulx/fO{ aflx/ 5fnfdf b]lv g] 3fpsf] cfwf/df cg'dfg ug{ ;lsb}g .</b></p> |
|--|

## 5fltsf] rf]6k6s (Chest Trauma)

Rff]6k6saf6 x'g] s'n d[To'dWo] 5fltsf] rf]6sf sf/0f sl/a @%Ü sf] d[To' x'G5 . d'Votof d'6' jf 7'nf /QmgnLdf cj/f]wsf sf/0f tTsf] d[To' klg x'g;S5 . 5fltsf] rf]6 eP/ tTsf] d[To' x'g'sf] d'Vo sf/0fdf Airway obstruction, Cardiac tamponade jf aspiration kb{5g\ .

**w]/}h;f] 5fltsf] rf]6k6s nfu]sf la/fdLx? ;fwf/0f t/ blftfk"0f{ tl/sfaf6 Joj:yfkg ug{ ;lsG5 / zNolqmofsf] cfjZostf kb}{g .**

Zjf;k|Zjf;df ;d:of jf sl7gfO{ lgDg sf/0fx?n] x'g]ub{5 M

- s/<sup>a</sup>x? efFIRrPdf÷ Flail Chest
- Pneumothorax - (kmf]S;f]sf] Kn'/fdf xfjf el/g')
- Tension pneumothorax
- Haemothorax - (kmf]S;f]sf] Kn'/fdf /ut el/g')
- Pulmonary contusion
- Open penumothorax
- Aspiration - (Zjf; gnLdf t/n kbfy{x? hfg')

Haemorrhagic shock sf d'Vo sf/0fx?

- Haemothorax - (kmf]S;f]sf] Kn'/fdf /ut el/g')
- Haemomediastinum - (5ftLsf] dWo efudf /ut hDg')

**!= s/Ë efFlrg'**

5ftLdf Rff]6 nfu]sf] 7fpFsf] s/<sup>a</sup>sf] x•L efFIRrg ;S5 h;n] To; d'lgsf] kmf]S;f]df 3fp kfg{ jf 5]8\g ;Sb5 . a[4 JoIQmx?df ;fwf/0f rf]6n] klg s/Ë efFIRrg ;S5 . o:tf efFIRrPsf s/Ëx? !) b]lv !% lbg leqdf ;fwf/0f tj/n] l:y/ x'G5g\ . 5 xKtfl5 Callus ag]kl5 dfq o:tf s/Ëx? /fd|f];Fu hf]l8G5g\ .

## @= Flail Chest

o; cj:yfdf Zjf;k|Zjf; k|lqmodf 5fltsf] efFlrPsf] cl:y/ efu 5ftLsf] cGo efusf] ljdkl/t lbzf tkm{ rNb5 . o;sf sf/0f Zjf;k|Zjf;df uDeL/ sl7gfO{ pTkGg x'G5 .

## #= Tension pneumothrax

Tension pneumothrax, kmf]S;f]sf] KNo'/fdf xfjf l5/] aflx/ lg:sg g;s]kl5 pTkGg x'G5 . o; ;d:ofnfO{ t'?Gt klxrfg u/L lgbfg ug{ ;lsPdf 3fOt]sf] Hofg arfpg ;lsG5 . o;n] ubf{ 5ftLleqsf] bjfj (Intrathoracic pressure) a9\g hfG5 h;n] ubf{ k|efljt 7fpFsf] ljdkl/tdf Mediastinal shift x'G5 . o:tf] a]nfd Zjf; km]g{ ufx«f] x'G5 / zl//df clS;hgsf] dfqf sd x'G5 . Intercostal drain eGbf cufl8 tTsfn needle decompression u/L kmf]S;f]df hd]sf] xfjf aflx/ lgsfNg'kb{5 . clGtd cj:yfdf kmf]S;fsf] KNo'/f leq hd]sf] xfjfsf] ann] ubf{ Zjf;gnL midline af6 6f9f ws]lnG5 .

## \$= Haemothorax

k|foM h;f] g5]l8Psf eGbf 5]l8Psf] 5ftLsf] rf]6k6sdf Haemothorax x'g] a9L ;+efjgf /xG5 . olb al9 /Qm>fj ePdf Hypovolaemic shock x'G5 / k|efljt kmf]S;f]df al9 rfksf] sf/0fn] ubf{ Zjf;k|Zjf;df sl7gfO{ cfpFb5 .

o;sf] pkrf/sf] /fd|f] ljlw Large chest tube sf] k|of]u ug'{ xf] .

- %)–!%) dL=nL= sf] Haemothorax df Intercostal catheter k|of]u u/L /Qm>fj /f]Sg ;lsG5 . To;sf] nflu ;fdfGotof Close Drainage dfq ul/G5 .
- !%)–@))) dL=nL= eGbf a9Lsf] x]df]yf]/]S; jf @))–#)) dL=nL= k|lt306f eGbf a9L b/df lg/Gt/ /Qm>fj ePdf yk hfFr k8tfn h:t} Thoracotomy sf] cfjZostf kb{5 .

## %= Pulmonary Contusion

5fltsf] rf]6k6sdf Pulmonary Contusion a9L b]lv]g] ub{5 . of] cToGt k|f0f3fts cj:yf xf] . o;sf c;/x? la:tf/} b]vf kb{5 / rf]6k6s nfu]sf] @\$ 306f ;Dddf o;sf] nlf0fx? w]/} b]lvG5 . o;f] x'g'sf] d'Vo

sf/0f tLa| ultsf] ;jf/Ldf x'g] b'3{6gf, 7"nf] prfOaf6 v:g' / uf]nL  
nfUg' xf] . o;sf] nlf0f tyf lrGxx? lgDgcg';f/ 5g\ M

- Dyspnoea : (Zj; k|Zj; df c; xh dxz'; x'g'\_
- Hypoxaemia (/utdf clS; hgsf] dfqf sd x'g'\_
- Tachycardia -d'6'sf] ult a9|g'\_
- Zj; k|Zj; sf] cfjfh lj/n} ;'lgg] jf ;'lgFb} g;'lgg]
- s/Ëx? efFIRrg'
- Cyanosis (z/L/ lgnf] x'g'\_
- s'g} klg blunt trauma / rib fracture x'Fbf pulmonary contusion z+sf ug'{kb{5 .

**z/L/sf] aflx/L rf]6sf] cfwf/df cfGtl/s rf]6sf]**

Open or “sucking” chest wound M k|efljt 7fpFsf]] kmf]S;f]sf] efu jfo'd08nLo rfksf] sf/0fn] lg:s[o x'G5, o;n] ubf{ Mediastinum k|efj gk/]sf] csf]{ efutkm{ ;b{5 . o:tf] cj:yfdf pkrf/ t'?Gt} ug'{kb{5 . v'Nnf 3fpnfO{ 5f]Kg'kb{5 . c:ktfn;Dd k'¥ofpFbf 5fltsf] v'Nnf 3fpnfO{ Knfli6ssf] Ps Kofs]6n] 5f]Kg'kb{5 h;n] Air Sucking /f]Sg d2t ub{5 . olb la/fdL hl6n cj:yfdf k'u]df Intercostal Drain, Intubation / Positive Pressure Ventilation sf] cfjZos kb{5 .

**rf]6k6sdf ;Defljt tn pNn]lvt cj:yfx? KlG cfpg ;Sb5g\ / lf]qLo c:ktfn?df ;d]t d[To'b/ a9L x'g;S5 . lognfO{ pko'Qm z}lfs p4]Zosf lgldQ tn pNn]v ul/Psf] 5 .**

Myocardial Contusion : of] 5ftLsf] Blunt trauma / Sternum jf s/Ëx? efFIRrbfsf] cj:yfdf b]vfk{5 . o;sf] lgbfgdf O=L=hL= df b]vf kg]{ c;fwf/0f /]vf / d'6'sf OGHfOdx?sf] dfqfdf cfpg] j[|4n] yk ;xof]u ub{5 . Cardiac Contusion n]] Åbo3ftnfO{ a9fpg ;S5 . olb ;Dej ePdf la/fdLnfO{ d'6'sf] cg'udg ul/g] 7fpFdf k7fpg' k5{ . xfdLx?n] ;f]r]eGbf a9L dfqfdf o:tf 36gxf? b]lvG5g\ / of] g} b'3{6gfaf6 x'g] cfsl:ds d[To'sf] sf/0f x'g;S5 .

Pericardial temponade : 5]l8Psf] / 3f]lrPsf d'6'sf uDeL/ rf]6x? zx/L lf]qdf d[To'sf] k|d'v sf/0fx? x'g\ . Blunt Trauma df Pericardial Temponade lj/n} b]lvG5 . olb o:tf] rf]6sf] 36gf pTkGg x'g] cj:yf b]lvPdf ;'Osf] k|of]u ul/ d'6'sf] k|l/sf]8{oddf hd]sf] t/n kbfy{ t'?Gt} lgsfNg'kb{5 (Pericardiocentesis) . lgDg cj:yfsf la/fdLdf Pericardial temponade x'g;Sb5, Vofn ug'{xf]; M



- ;+3ft (Shock)
- 3fF6Lsf lz/fx? km'n]sf (Distended Neck Veins)
- z/L/sf] xft v'6\6fsf] tfkqmd lgs} sd ePsf]
- Muffled Heart Sound -d'6'sf] cfjfh sd ;'lgg]\_

**Pericardiocentesis:** (;'Osf] k|of]u u/L d'6'sf] k]l/sfl8{odf hd]sf] t/n kbfy{ lgsfNg]\_] of] pkrf/sf] z'?sf] ljlw xf] / o;sf af/]df k|of]ufTds ;qdf 5nkmn ul/g]5 .

**5ftLsf] 7''nf /QmgnLsf] rf]6** (Thoracic great vessel injuries): kNdf]g/L lz/f (Pulmonary veins) jf wdgL (arteries) df rf]6 nfUg' cToGt 3fts x'G5 / w]/} cj:yfdf tTsf n d[To'sf] sf/Of aGb5 .

**Trachea jf Major Bronchus km'6\g'** (Rupture of trachea or major bronchi): Trachea jf Major Bronchus df rf]6 nfUg' cToGt vt/fhgs dflgG5 / o;af6 cg'dflgt d[To'sf] %)Ü ;Dd la/fdLx?sf] d[To' x'g]ub{5 . clwsf+z - \*)Ü\_ o:tf Zjf;gnLsf rf]6x? Zjf; gnLsf] Sol/gf sf] @=% ;]=dL= leq nfUb5g\ . Zjf;gnLsf] rf]6k6sdf ;fdfGotof b]lv]g] d'Vo nlf0fx? M

- Hyemoptysis -vsf/df /ut cfpg'\_
- Dyspnoea -bd a9\g'\_
- Sub-cutaneous and mediastinal emphysema (5ftLsf] lar efu tyf 5fnfd'gLsf tGt'df xfjf el/g')
- Cyanosis -slxn]sfFxl clS;hgsf] sdL eO z/L/ gLn]f] x'g')

**cGggnL** (Oesophagus) **df rf]6 nfUg' M** of] Blunt Trauma ePsf] JolQmdf la/n} kfOG5 . d'Vo u/L 5fnf 5]l8Psf] Pj+ 3f]lrP/ uDeL/ rf]6 nfu]sf] JolQmdf cGggnLdf Kjfmx? kb{5g\ . cGggnLdf rf]6 nfu]sf] kQf gnfu]df k|f0f3fts x'g;S5 lsgsL o;af6 5ftLsf dWoefusf c+ux?df ;+qmd0f (Mediastinitis) x'g;Sb5 . 3fOt] la/fdLn] k|foM Epigastrium / 5ftLsf] s8f b'vfO{ dx;'; ub{5 / of] b'vfO{ k5fl8 9f8lt/ ;/]sf] lzsfot ub{5 . o;sf cGo nlf0fx? Dysponea, Cyanosis / Shock x'g\, t/ oL nlf0fx? l9nf b]lvG5g\ .

**8fok|mfdsf] rf]6k6s** (Diaphragmatic Injuries): of] d'Vo ?kdf 5ftLsf Blunt Trauma ePsf JolQmx?, ;jf/L b'3{6gfsf 3fOt]x?df x'G5 . k|foMh;f] o;sf] lgbfg ug{ lal;{G5 . 5ftLsf s'g} klg 5fnf 5]l8Psf / 3f]lrPsf rf]6k6sx? nfUbf 8fok|mfddf klg rf]6 (Diaphragmatic Injuries) 5 egL z+sf ug'{k5{ . h:t}M

- cuf]8tkm{sf rf}yf] s/a d'gLsf] efu (Below 4th intercostal space anteriorly)

- 5]paf6 5}6f}+ s/a d'gLsf] efu (6th Interspace laterally)
- k5fl8tkm{sf] cf7f}+ s/a d'gLsf] efu (8th Interspace posteriorly)
- k|foh;f] afofFtkm{

**5ftLsf] wdgL** (Thoracic aorta) **km'6\g' M** of] d'Vo ?kdf tLj| ultsf]  
;jf/L b'3{6gf jf cUnf] 7fpFaf6 tn v:gfn] ubf{ x'G5 . o;df d[To'b/  
a9L x'G5 . lsgsL] d'6'n] % ln=÷k|ltldg]6 /ut kDk (Cardiac Output) u5{  
/ jo:s JolQmsf] zl//df % ln6/ dfq /ut x'G5 .

**;fawfg M 5fnf 5]l8Psf / 3f]lrPsf 5ftLsf rf]6k6sdf** Pericardial  
**Tamponade x'g;S5 .**

## **k]6sf] rf]6k6s (Abdominal Trauma)**

z/L/sf] w]/} efux?df rf]6k6s nfUbf k]6df ;dfGotof rf]6 nfUb5 .  
5fnf 5]l8Psf Pj+ 3f]lrPsf ulx/f] rf]6k6s (Penetrating Trauma) ePsf]  
JolQmdf sn]hf] / 5fnf g5]l8Psf Pj+ g3f]lrPsf rf]6k6s (Blunt Trauma)  
ePsf] JolQmdf lkmof] (Spleen) RofltPsf] jf km'6]sf] x'G5 .

**k]6df rf]6 nfu]sf] la/fdLsf] k]/lDes k/Llf0fdf tnsf  
cj:yfsf] d'Nofs+g u/]s} x'g'kb{5 .**

**A -Zjf;dfu{ / uw{gsf] ;';'Dgf** Airway / C-spine), **B -:jf;k|Zjf;, Breathing),**  
**C -/Qm;~rf/** Circulation), **D -c;lfdtf / :gfo'sf] n]vfhf]vf,** Disability and neurological assessment) **tyf E -la/fdLsf] z/L/sf] k'0f{ c]nf]sg** Exposure) .

s'g} klg uDeL/ 36gfsf lj/fdLx?df ha;Dd k"0f{ hfFr eO;s]sf]  
x'Fb}g ta;Dd k]6sf] rf]6 nfu]sf] dfGg' kb{5 . rf]6k6skl5 /f]syfd  
ug{ ;lsg] d[To'sf sf/0fx? dWo] kQf gnfu]sf k]6sf rf]6k6s d'Vo xf]  
.

### **k]6sf] rf]6sf d'Vo b'O{ k]/sf/ 5g\M**

- 5fnf 5]l8Psf Pj+ 3f]lrPsf uDeL/ rf]6 h;sf nflu zNolrlsT;f  
k/fdz{sf] cfjZostf kb{5 . h:t} M
  - uf]nL nfu]sf]
  - rSs'n] xflgPsf]
- 5fnf g5]l8Psf Pj+ g3f]lrPsf rf]6k6s, h:t} M
  - blaPsf] (Compression)
  - lylrPsf] (Crush)
  - Seat belt
  - Itj]ultsf sf/0f ePsf] rf]6k6sx?

w]/} dfqfdf k]6df /ut hd]sf] (Haemoperitoneum) @)Ü 3fOt] JolQmdf  
Peritoneal irritation klxnf] hfFrdf b]lv+b}g / o:tf] cj:yfdf k'gM k]fylds  
lg/Llf0f ug'{kb{5 .

ljz]if u/L cr]t JolQmdf Blunt Trauma sf] n]vfhf]vf ug{ ufx|f] x'g;S5 .  
 o:tf la/fdLx?sf nflu k]6df ePsf kbfy{x? aflx/ lgsfNg' (Peritoneal  
 Lavage) cfjZos x'G5. -k|of]ufTds ;];gdf ;ldlff ug'{kg]} . k]6sf]  
 rf]6k6s 5}g egL kSsf ug{ Exploratory Laparotomy g} pko'Qm pkfo  
 x'g;S5 .

k]6sf] ;Dk"0f{ zf/LI/s hfFrdf **dnåf/sf]** (Rectal) **hfFrdf ;fy}** lgDg  
 s'/sf] hfFr? klg kb{5 M-

- l:kGr/ 6f]g (Sphincter Tone)
- dnåf/sf] leQsf] Ps?ktf (Integrity of rectal wall)
- dnåf/df /ut b]lv'g' (Blood in rectum)
- k[f]:6]6 sf] :yfg

External urethral meatus df /ut b]vf k/]÷gk/]sf] x]g{ ge'Ng'xf]nf .

Pelvic **sf] rf]6df** Catheterization ;fjwfgL k']s ug'{ kb{5.

k|df]0ft geP;Dd dlxnf?nfO{ ue{jtL g} dfGg'k5{ . k]6df /x]sf]  
 aRrf uDeL/ cj:yfdf x'g;S5 / o:tf] a]nfd] k]6df /x]sf] aRrf arfpgsf]  
 nflu cfd]sf] Resuscitation g} pko'Qm pkrf/ ljwL xf] . c? cj:yf h] ePkg  
 ue{ cj]w k'/f ePsl dlxnf] xsdf aRrf h]Gd;s]kl5 dfq Resuscitation  
 /fd]/L ug{ ;lsG5 . o:tf] cj:yfnfO{ plrt ;dodf g} n]vfhf]vf ug'{kb{5.

k]6 leqsf] rf]6sf sf/0f /Qm>fj ePsf] jf cfGb]fdf Kjfn k/]–gk/]sf]  
 lgSof}{n ug{sf] nflu Diagnostic peritoneal lavage (DPL) ;xof]uL x'g;S5 .  
 o;sf kl/0ffdx? lgs} ;xof]uL x'G5g\ t/ of] g} hfFrdf] pko'Qm ljwL xf]  
 egL ckJofVof x'g] u5{ . olb s'g} z+sf ePdf Laparotomy g} pTs[i6  
 ljwL xf] .

**k]6df ePsf kbfy{x? aflx/ lgsfNg' kg]} (Diagnostic peritoneal lavage)**  
**cj:yfx? M**

- c1ft k]6 b'vfO{
- 5ftLsf] tNnf] efusf] rf]6
- Hypotension x'g' tyf ljgfsf/0f g} Hematocrit tn emg'}
- Nffu' jf dfbs kbfy{sf] sf/0f jf 6fpsf]df rf]6 nfu]/ lbd]fuL xfnt  
 l7s gePsf] la/fdLn]fO{ k]6sf] rf]6 nfu]sf] 5 eg]
- k]6 / ;'z'Dgf (Spinal Cord) b']}df rf]6 nfu]sf]

- Pelvic Bone efFlrPsf]

## **lgDg cj:yfx?df l8=lk=Pn= (DPL) ug'{ vt/fk"0f{ x'g;S5**

- ue{jtL
- klxn] g} k]6sf] zNolqmof (Surgery) ePsf]
- cg'ejxLg zNolqmof ug]{ JolQm .
- l8=lk=Pn n] la/fdLsf] Joj:yfkgdf km/s gkg]{ ePdf

## **k]6sf] rf]6sf cGo ljz]if kl/l:yltx?**

Pelvic fracture kl5 7"nf] dfqfdf /Qm>fj eP/ / d'qgnL / u|GyLdf rf]6 nfu]/ lj/fdLsf] cj:yf uDeL/ x'G5 .

- k|f]:6]6 (Prostate) sf] l:ylt kQf nufpg / u'KtfË lf]qsf] RofltPsf 3fpx? - Perineal Laceration) eP÷gePsf] kQf nufpg dnåf/ (Rectum) sf] hfFr ug'{ kb{5 .
- Pelvic X-Ray -olb clinically la/fdLsf] lgbfg ug{ ufx|f] ePdf\_

## **sDd/sf] x•L efFIRrP kl5sf] Joj:yfkg**

- Resuscitation( ABC)
- la/fdLnfO{ /ut lbg'kb{5 (Transfusion)
- xnrn gu/fpg] / zNolqmofsf] nflu n]vfhf]vf ug]{} (Immobilization and assessment for surgery)
- Analgesia

|   |
|---|
| <b>sDd/sf] x•L efFIRrPdf k fo h;f] w]/} /ut aUg ;S5 .</b> |
|---|

## 6fpsfsf] rf]6 (Head Trauma)

6fpsf]sf] rf]6 nfu]sf] JolQmx?sf] tTsf n]vfhf]vf gul/Pdf o;n] 3fOt] la/fdLsf] afFRg] / lgsf] x'g] ;+efjgfnfO{ ;dfKt kfl/lbG5 . 6fpsf]df rf]6 nfu]sf] lj/fdLsf] d[To'b/ Hypoxia / Hypotension n] bf]Aa/ agfpFb5 .

tn pNn]lvt cj:yfx? Hofg lng ;Sg] vfnsf rf]6k6sx? x'g\ / lhNnf c:ktfndf logsf] pkrf/ ug{ lgs} sl7g kb{5 . **o:tf] a]nfd, tkfO{+n] cf^gf] blftf, cg'ej / pknAw ;|f]tx?sf] k|of]u u/L 3fOt]x?sf] auL{s/0f u/L, s;/L pkrf/ sfo{ ug}'x'G5, To;df w]/} e/ kb{5 .**

tn pNn]lvt cj:yfx?sf] t'?Gt} kQf nufP/ l56f] Joj:yfkg ug}'kb{5 .

### **PSo'6 PS:6«f8'/n (Acute Extradural)**

o; cj:yfsf d'Vo nlf0fx?

- cr]t x'g' / l5gl5gdf k]m/L ;fdfGo cj:yfdf cfpG' (Lucid Interval) / ;Fu;Fu} l56f] cj:yf lau]g' .
- Middle Meningeal Artery af6 /Qm>fj x'g' / Intracranial Pressure a9\g' .
- rf]6sf] ljk/Lt efudf klf3ft b]vf kg' (Hemiparesis) / rf]6 ePsf] efusf] cfFvfsf] gfgL grNg' .

### **PSo'6 ;a8'/n x]df6f]df (Acute Subdural haematoma)**

dl:tsdf Contusion eO{ Subdural Space df /ut hd]kl5 of] cj:yf cfpF5 . dl:tssf] leqL efu (Cortex) / aflx/L efu (Dural) hf]8\g] aLrsf] gnL (Vein) RofltPkl5 of] cj:yf b]vf kb{5 .

**dfly plNnlvt cj:yfx?sf] Joj:yfkg eg]sf] zNolqmf (Surgery) g} xf] / o;sf] k|To]s k|of;x? Burr-hole decompression tkm{ nllft x'g'kb{5 .**

tn plNnlvt cj:yfx?sf] Joj:yfkg conservative treatment af6 ug}'kb{5 lsgsL :gfo' zNolrlsT;f (Neurosurgery) n] o:tf cj:yfdf ck]llft kl/Ofd lbg ;Sb}g .

- **vKk/sf] tNnf] efu efFIRrg'** (Base of skull fractures)  
Eyelid lgnf] x'g' (Raccoon eyes) jf sGr6df (Mastoid Process) lgnf] x'g'  
(Battle's sign) / sfg jf gfsaf6 Cerebrospinal Fluid (CSF) r'lXP/ aflx/ lg:sg' .
- **Cerebral Concussion**  
s]xL ;dosf] nflu r]tgf x/fpg' .
- **vKk/ k'm6]/ vf]lkN6f] kg'}** (Depressed skull fracture)  
efFIRrPsf] vKk/sf] efun] 8\o'/f (Dura) / dl:tsdf (Brain) 5]8\g ;S5 .
- **dl:tsdf /ut hDg'** (Intracerebral haematoma)  
d'Vo ?kdf uDeL/ rf]6 nfu]/ jf klxn] nfu]sf] rf]6af6 cj:yf lju|b}  
uP/ o:tf] cj:yf cfpFb5 .

r]tgfdf cfpg] km/s (Alteration of Consciousness) g} dl:ts rf]6sf] d'Vo lrGx  
(Hall Mark) Xf] .

## **6fpsf]sf] rf]6sf] hfFr ubf{ / Resuscitation ubf{ x'g] k|fo uNtLx? M**

- A-B-C ug{ c;kmn x'g' / k|fyldstf cg';f/ sfo{ Joj:yfkg ug{ g;Sg'
- aflx/af6 gb]lv] 6fpsfsf] rf]6k6s af/]df yxf gkfp'g'
- :gfo' k|0ffnLsf] cfwf/e't n]vfhf]vf ug{ c;kmn x'g'
- la/fdLsf] l:ylt lau|Fb} uPsf] yxf gkfp'g' .



## 6fpsf]sf] rf]6k6ssf] Joj:yfkg

**Zjf;dfu{** (Airway), **Zjf;k|Zjf;** (Breathing) / **/Qm;~rf/** (Circulation) ;'rf? / **l:y/ ug'{kb{5 -;+ej eP uw{gnfO{ l:y/ /fVg'k5{** . la/fdLsf] dl:ts / :gfo' ;DaGwL cj:yfsf] d'Vo dxTjk"0f{ ;'rsx? lgoldt ?kdf /]s8{ / cg'udg ug'{kb{5 . Glasgow Coma Scale (GCS) n]vfhf]vf ug'{kb{5 . - cg';'rL \$ x]g'{xf];\ \_

### ofb /fVg'xf];\M

- GCS \* jf sd ePdf 6fpsfsf] uDeL/ rf]6
- GCS (-!@ ePdf 6fpsfsf] dWod vfnsf] rf]6
- GCS !#-!% ePdf 6fpsfsf] ;fwf/0f rf]6

### /Qm>fjsf] sf/0fn] la/fdLsf] cj:yf lju]g ;S5M-

- cfFvfsf] gfgL km'n]sf] jf km/s cfsf/sf] ePdf 6fpsf] leqsf] rfk a9]sf] hgfpF5 .
- ao:s JolQmnfO{ nfu]]sf] 6fpsf] jf lbdfusf] rf]6 slxNo} klg Hypotension sf] sf/0fn] ubf{ x'Fb}g .
- la/fdLnfo{ Sedation ug'{ x'Fb}g lsgsL o;n] lj/fdLnfo{ cr]t dfq agfpg] xf]Og Zjf;sf] b/ sd ug]{ / sf]{g8fo{cS;fo8sf] (CO<sub>2</sub>) dfq a9fpg] (Hypercarbia) ub{5 .
- w]/) Intracranial pressure a9]kl5 Cushing response b]vf kb{5 . of] cToGt sl7g / clGtd cj:yfsf] ;'rs xf] . o;sf d'Vo nlf0fx?
  - gf8Lsf] ult sd x'g' -Bradycardia)
  - pRr /Qmrfk -Hypertension)
  - Zjf;k|Zjf; b/df sdL cfpg' (Decreased respiratory rate)

### 6fpsfsf] uDeL/ rf]6x?sf] pkrf/ Joj:yfkgdf tn plNnlvt sfo{x? kb{5g\

- Intubation / Ventilation h;n] dWod :t/sf] xfOkf]SoflKgof (Hypocapnia, PCO<sub>2</sub> to 4.5-5 kpa) u/fpF5 . o;n] Intracranial Blood Volume / Intracranial pressure nfO{ c:yfoL ?kn] eP klg 36fpFb5 .
- ;+efljt klf3ft nfO{ Wofgdf /fvL n7\ofpg' .(Sedation with possible Paralysis)
- Diuresis ;lxtsf] IV fluid lbg] -a9L dfqfdf glbg] \_
- 6fpsf]nfO{ @)Ü ;Dd dfly p7fpg] .

- z/L/nfO{ pRr tfk -Hyperthermia) af6 arfpg' .

**cndNndf k/]sf] la/fdL nIYpsf] cj:yfdf kfOPdf To;sf] sf/0f  
/S;L g} xf] eg]/ slxNo} cg'dfg ug'{x'Fb}g**

## 'if'Dgfsf] rf]6 (Spinal Trauma)

z/L/sf] w]/} 7fpFdf rf]6k6s nfUbf :gfo'df rf]6 nfUg] ;Defjgf al9  
x'G5 . :gfo'sf] d'Vo rf]6x?df cf}+nfsf] :gfo'sf] rf]6, Brachial Plexus /  
Spinal cord sf] rf]6 kb{5g\ .

**o;sf] Joj:yfkgfsf] k|yd k|fyldstf eg]sf] k|f/IDes lg/Llf0f u/L A-  
B-C-D-E d'Nofs+g ug'{ xf] .**

A - Spinal Cord df x'g;Sg] ;+efljt rf]6nfO{ Vofn u/L Zjf;dfu{sf]  
Joj:yfkg ug]{

B - Zjf;k|Zjf;sf] lgoGq0f jf Joj:yfkg

C - /Qm;~rf/sf] lgoGq0f / /Qm rfk (Blood Pressure) sf] cg'udg ug'{

D - Disability - :gfo' ;DaGwL rf]6sf] lg/Llf0f / r]tgf:t/ ;DjlGw  
canf]sg ug'{ .

E - Exposure la/fdLsf] sk8fx? vf]nL 5fnf / xftv'§fdf nfu]sf] rf]6sf]  
hfFr ug' .

'if'Dgfsf] rf]6 nfu]sf] JolQmsf] hfFr la/fdLnfO{ gv'DrfP/, gtGsfP/  
/ g3'dfP/ ug' kb{5 / o:tf] a]nfdnf ;'if'DgfnfO{ s'g} xnrn ug' x'Fb}g  
. o:tf] la/fdLnfO{ M-

- d'9f h:t} 3'dfpg] (Log rolled) - k|of]ufTds ;qdf 5nkmn ul/g]5 .
- plrt tl/sfn] l:y/ u]/ /fVg] -l;wf /]vdf l:y/ /fVg], 3fF6Lsf] nflu  
Cervical Collar jf afn'jfsf] y}nL k|of]u ug]{ - - k|of]ufTds ;qdf  
5nkmn ul/g]5 .
- oyfj:yfdf xnrn gu/fO n}hfg' kb{5 .

Vertebra **sf] rf]6 nfu]sfx?nfO{ ;'if'Dgfsf] klg rf]6 x'g;S5 .**

lgDg s'/f x]g]{ M

- Local tenderness
- Deformities ;Fu;Fu} Posterior Step-off injury x]g]{
- Oedema (;'lGgg')

## ;if'Dgfsf] rf]6nfO{ OlËt ug]{ nlf0fx? (Clinical Findings)

- Diaphragmatic breathing - Paradoxical Breathing sf] hfFr ug]{ .
- n'nf] (Flacid) x'g' tyf k|ltlf]k lqmof (Reflex Action ) z'Go x'g' -dn4f/hfFr ug]{
- Go'g /Qmrfk tyf gf8Lsf] ult sd x'g' (Hypotension with bradycardia)
- C-Spine M -olb pknAw ePdf\_ uw{gsf] x•Ldf rf]6 nfu]sf] ;+efjgf ePsf k|To]s 3fOt]sf] AP tyf Lateral View df kf/] PS;/] ug'{kb{5 tfsL Axis-atlas aLrsf] hf]gL{ /fd|/L b]lvof];\ . AP tyf Lateral View df PS;/] ubf{ ;ft} j6f Cervical Vertebra b]lv' kb{5 .

**;fjwfg — uw{gsf] xl•df rf]6 nfu]sf] ;+efjgf ePsf la/fdLnfo{ slxn] klg a;fn]/ jf 3f]K6f] kf/] nfg' x'Fb}g . lj/fdLnfo{ Ps 7fpFaf6 csf]{ 7fpFdf n}hfg'cl3 la/fdL l:y/ cj:yfdf 5 jf 5}g Vofn ug'{k5} .**

## :gfo' ;DaGwL n]vfhf]vf (Neurological assessment)

:gfo'sf] rf]6sf] cj:yfsf] clg]fo{ n]vfhf]vf ul/g'kb{5 . olb la/fdL xf];df ePdf, p;sf] r]tgfsf] cj:yf yxf kfp g la/fdLnfo{ k|Zg ug'{xf];\ / ;fwf/Of xnrn ug{ k]l/t ug'{xf];\ h;n] ubf{ la/fdLsf] xft tyf v'6\6f rnfpg ;Sg] lfdtf (Motor Function) yxf kfOof];\ .

3fpsf] cj:yf yxf kfp g tn p|Nnlvt Key Reflex Assessment sf] lg/Llf0f ug'{kb{5 .

## df]6/ k|ltlqmof (Motor Response)

- Diaphragm intact level C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>
- Shrug Shoulders C<sub>4</sub>
- Biceps - s'lxgf v'Drfg' C<sub>5</sub>
- gf8L tGsfpg' (Extension of Wrist) C<sub>6</sub>
- s'lxgf tGsfpg' (Extension of Elbow) C<sub>7</sub>
- gf8L v'Drfg' (Flexion of Wrist) C<sub>7</sub>
- cf]+nf km6\ofpg' (Abduction of Fingers) C<sub>8</sub>
- 5ftL k'mnfg' (Active Chest Expansion) T<sub>1</sub> - T<sub>2</sub>
- It3]sf] hf]gL{ v'Drfg' (Hip Flexion) L<sub>2</sub>

- 3'F8f tGsfpg' (Knee Extension) L<sub>3</sub> - L<sub>4</sub>
- s's'{RrfnfO{ dfly v'DRofpg" (Ankle Dorsi Flexion) L<sub>5</sub> - S<sub>1</sub>
- s's'{Rrf tn v'DRofpg" (Ankle Plantar flexion) S<sub>1</sub> - S<sub>2</sub>

**r]tgf k|ltlqmof (Sensory Response)**

- lt3|fsf] cl3Nnf] efu (Anterior Thigh) L<sub>2</sub>
- 3'F8fsf] cl3Nnf] efu (Anterior Knee) L<sub>3</sub>
- s's{Rrfsf] cufl8sf] 5]psf] efu (Anterio Lateral Ankle) L<sub>4</sub>
- v'§fsf] a'9L cf}+nf / bf];|f] cf}+nf (Second Toe) sf] dflyNnf] efu L<sub>5</sub>
- v'§fsf] 5]psf] efu (Lateral side of Foot) S<sub>1</sub>
- lk8f}nfsf] kl5Nnf] efu (Posterior Calf) S<sub>2</sub>
- dnåf/ j/k/sf] r]tgf (Perianal Sensation) S<sub>2</sub> - S<sub>5</sub>

olb low BP / low pulse 5 eg] Spinal trauma sf] sf/Ofn] ubf{ sympathetic tone 36]sf] x'G5 .

o;sf] nflu IV fluids lbg], sympathetic tone a9fpg dopamine lbg] .

**gf]6 M olb Complete Spinal Cord Lesion xf] / r]tgf tyf rnfpg] sfo{ (Sensory Motor Function) 5}g eg] lgsf] x'g] ;+efjgf w]/} sd x'G5 .**

**;if'Dgfsf] rf]6 nfu]sf] cj:yfdf :jrflnt lqmofx? (Autonomic Function) lz3| ?kdf 36]sf] b]lvG5 / l9nf] lgsf] x'G5 .**

## xftv'šfsf] rf]6k6s (Limb Trauma)

o;sf] hfFrdf lgDg s'/fx? ;dfj]z x'g'kb{5

- 5fnfsf] /Ë / tfkqmd
- Distal Pulse sf] lg/Lf0f
- Grazes / Bleeding Sites
- xft–v'šfsf] l:ylt (Alignment and Deformities)
- ;lqmo / lgl:qmo rfn
- ck|fs[lts rfn / cfjfh (Crepitation)
- rf]6af6 k}bf ePsf] b'vfO{sf] cj:yf

### xftv'šfsf rf]6k6ssf] Joj:yfkgsf] p2]Zo M

- 5]p5fpsf tGt'x?df (Peripheral Tissue) /utsf] kljfx u/fO/xg'
- Infection /f]Sg' / Skin Necrosis af6 arfpg'
- Peripheral Nerves df rf]6 k'Ugaf6 arfpg'

### xftv'šfsf] rf]6 ;DaGwL ljz]if ;jfnx?M

- /Qm>fj e}/x]sf] 5 eg] Torniquet k|of]u ug'{eGbf l;w} bjfj (Pressure) lbP/ /Qm>fj /f]Sg'kb{5 . Isgeg] Torniquet e'n]/ lemSg lal;{Pdf /Qm;+rf/ sd eO{ c? a9L lflt (Ischaemic Damage) x'G5 .
- Afflx/ xl• b]lv] u/L efFIRrPsf] tyf efFIRrPsf] 7fpF j/k/ ePsf] 3fpx? xl•;Fu hf]l8\Psf] x'g;S5g\ . o:tf] cj:yfdf pkrf/sf] lalwdf lgDg s'/f ug'{kb{5 .
  - afxØ /Qm>fj /f]Sg'xf];\ .
  - Immobilise ug'{xf];\ / b'vfO sd ug'{xf];\ .
- Fascial Compartment df cfGtl/s rfk a9]kl5 Compartment Syndrome b]vfkb{5 . h;n] rf]6 nfu]sf] 7fpF j/k/sf /QmgnL / :gfo'x?df bafj k}bf ub{5 . o;n] ubf{ /QmgnL / :gfo'x?df xfgL k'Ub5 / cGTodf df+zk]zLdf /Qm;+rf/ /f]lsg] (Ischaemia) tyf Necrosis x'g;S5 ;fy} k|efljt efusf] sfo{df klg sdL cfpFb5 .
- **xftv'šfsf** 6'lqmP/ 5'6]sf] (Amputated) efunfO{ lgdnL{s/0f ul/Psf] tyf Saline df lehfOPsf] Sterilized gauze towel sf] k|of]u u/L 5f]Kg' kb{5 / lgd{nLs/0f ul/Psf] Plastic Bag leq /fVg'kb{5 . z/L/sf] 6'lqmP/ 5'6]sf] t/ glr:ofOPsf] efu eP 36gf 36]sf] ^ 306fleq k|of]udf Nofpg ;lsG5 t/ lr:ofOPsf] eP !\* b]lv @) 306f leq k|of]udf Nofpg ;lsG5 .

**z/L/ 5]8]/ w]/} leq k;]sf æafx\o a:t'Æ (Foreign body) nfO{ Surgical  
Exploration åf/f 7Dofpg] cj:yf geP ;Dd TolQs} /xg lbg'k5{ .**

## Limb Support : Early Fasciotomy

Compartment Syndrome **af6 x'g] ;d:ofx?nfO{ k|foh;f] sd cFFsng ul/G5 .**

- Intramuscular hematoma, Crush Injuries **cyjf xf8 efFlrPsf] tyf c+u l5lgPsf rf]6k6sx?df** Compartment Syndrome **b]lvG5, h;df k|foh;f]** Intra muscular pressure **a9\5 /** Local Circulatory collapse **x'G5 .** **olb** Systolic BP **sd ePdf, yf]/} dfqfdf df+;k]zL leqsf]** Pressure **a9\bf klg :yfgLo tGt'x?df /Qm;+rf/ sd** -Hypoperfusion) **x'ghfG5 . z/L/sf] ;fdfGo tfkqmddf** Systolic BP 80 mmHg **eGbf sd x'g] ljlQs} xftv'§fsf] /Qm;~rf/ 36\g z'?x'G5 .**

- **/Qm ;+rf/ k'gM sfod u/]kl5 klg** (Reperfusion) **k|fo uDeL/ lflt x'G5** (The damage on reperfusion is often serious) **olb :yfgLo tGt'x?df /utdf clS;hgsf] dfqf sd ePsf]** -Local Hypoxemia- High IM Pressure, Low BP) **@ 306f eGbf a9L ePsf] v08df** Reperfusion **x'Fbf /QmgnLx?df ulDe/ lflt k'¥ofpF5 . o;sf/0fn] ubf{ l56f]** decompression **ug'{kb{5 . d'Vo ?kdf xft / v'§fsf] tNnf] efusf** Compartment **x? a9L hf]lvddf x'G5g\ .**

**olb /Qm>fjsf] >f]t lgoGq0f ePsf] 5 /** Evacuation **sf] nflu \$ 306f eGbf a9L ;do nfU5 eg] xft / v'§fsf] tNnf] efux?sf]** In-field Fasciotomy **ug{ ;lsG5 .** Fasciotomy **s'g} blf 8fS6/ jf g;{åf/f** Ketamine anesthesia **k|of]u u/L lhNnf :t/df ug{ ;lsG5 .**

**gf]6 M =====**



## ljz]if rf]6k6ssf 36gfx? (Special Trauma Cases)

### afNocj:yf (Paediatrics)

afnaflnsdfd x'g] d[To'sf] d'Vo sf/s tTj rf]6k6s xf] h'g a9L dfqfdf s]6fx?df kfOG5 . uDeL/ rf]6 nfu]sf afnaflnsfsf] afFRg] d'Vo cfwf/ eg]sf] c:kftn nlug' cufl8 ul/g] :ofxf/ tyf Resuscitation g} xf] .

3fOt] afnaflnsfsf] k|f/IDes n]vfhf]vdfd k|of]u x'g] ljlw ao:ssf] h:t} g} xf] . klxnf] k|fyldstf eg]sf] Zjf;dfu{sf] Joj:yfkg / Zjf;k|Zjf; lqmf xf] . To;k|5 /Qm ;~rf/ Joj:yfkg, :gfo'k|0ffnLsf] k|f/IDes n]vfhf]vf / cGTodf aRrnfO{ lr;Lg glbO z/L/ v'Nnf kf/L hfFRg' xf] .

**cg';"rL @ df afn/f]usf ;fdfGo dfkx? lbOPsf] 5 .**

**afnaflnsfsf] nflu lAfz]if Resuscitation tyf Intubation sf ;jfnx? lgDg cg';f/ 5g\M**

- 6fpsf], lha|f] tyf gfssf] Zjf; dfu{ ;fk]llfs ?kdf 7"nf] x'g' .
- ;fgf aRrfdg gfsaf6 Zjf; km]g}{ .
- Angle of Jaw 7"nf] x'g', Larynx dfly x'g' / Epiglottis 7"nf] / U cfsf/sf] x'g' .
- Larynx sf] ;aeGbf ;fgf] efu Cricoid n] ETT sf] cfsf/ lgwf{/Of ub{5 . ao:s x'Fbf Larynx klg a9\5 / ;aeGbf ;fgf] efu ?b|306L (Cord) x'G5 .
- e/v/ hIGdPsf] aRrfsf] Trachea \$ ;]dL nfd] x'G5 h;df @=%-# dL=dL= Diameter sf] ETT (Endo Tracheal Tube) k|of]u ug'k5{ . jo:s Trachea sl/j !@ ;]=dL= nfd] x'G5 .
- Resuscitation ul/;s]kl5 k|foM k]6 k'mN5 / km'n]sf] k]6 36fpg Nasogastric tube sf] k|of]u ;xof]uL x'G5 .

olb Zjf;gnLaf6 6\o'a xfNg'kg]{ cj:yf cfPdf !) jif{eGbf d'lgsf aRrxf?df Cuffed Tube sf] k|of]u ug'x'Fb}g lsgsL o;n] Subglottic swelling / Ulceration u/fpg ;S5 . lzz' tyf ;fgf aRrxf?df gfsaf6 eGbf d'vaf6 Intubation u/fpg ;lhnf] x'G5 .

la/fdL afnaflnsfdf x'g] Shock -cg';"rL @ x]g' {xf];\\_

afnaflnsfdf Pulse 5fDgsf] nflu pko'Qm 7fpF eg]sf] sfF5 (Groin) sf] Femoral Artery / s'lxgfsf] cl3Nnf] efu (Anticubital fossa) sf] Brachial Artery xf] . olb aRrfd] Pulse ge]l6Pdf Cardiopulmonary Resuscitation z'? ug' {kb{5 .

la/fdL afnaflnsfdf Shock sf nlf0fx?M-

- gf8Lsf] ult a9\g' -Tachycardia)
- gf8L ;fx|} Weak x'g' jf x'Fb} gx'g'
- Capillary Refill @ ;]s]08 eGbf a9L x'g'
- Zjf;b/ a9\g' (Tachypnoea)
- 56k6L x'g''
- em'Dd kg' { (Drowsiness)
- lkzfa sd x'g'

Severe Shock ePsf] cj:yfdf klg Hypotension w]/} kl5 dfq b]vfk g{ ;S5, .

**rf]6k6s nfu]sf afnaflnsfdf Joj:yfkg ug]{ k|s[of ao:sx?nfO{ ul/g] ljlw h:t} g} x'G5**

**Vascular Access Should be obtained** M b'O{ j6f Large Bore Intravenous Canula nufpg' kb{5 . klxn] Peripheral Veins df k|of; ug' {kb{5 / d'Vo lz/fx?df Central venous catheters /fVg' x'Fb}g . o:tf] sfdsf nflu pko'Qm efux? sfF5 (Groin) sf] Femoral Vein / ankle sf] Long Saphenous Vein xf] .

**Intra Osseous Access -x•Laf6 z/L/ leq fluid lbg] tl/sf\_:** z/L/df Fluid k7fpg' cToGt ;'/lft / k|efjsf/L ljlw xf] . olb xf8sf] aLrfd] (Intraosseous) k|of]u x'g] ;'O{ gePdf, Spinal needle k|of]u ug' ;lsG5 . o;sf] nflu pko'Qm efu eg]sf] Tibial tuberosity eGbf d'gL Tibia sf] cufl8sf] aLrsf] (Anteromedial) efu xf] . Epiphyseal growth plate nfO{ arfpg' kb{5 .

**Fluid Replacement** sf] d'Vo p2]Zo lzz' (Infant) df !-@ ld=ln=÷ s]=hL=÷306fsf b/n] / 7"nf aRrfd] (Adolescent) )=%-! ld=ln=÷s]=hL=÷306fsf b/n] lkzfa u/fpg' xf] . z'?df @) ld=ln= k|lt s]=hL= z/L/sf] tf}nsf b/n] Normal Saline Ps}rf]6L (Bolus) lbg'kb{5 . olb bf]>f] k6s Bolus lb+bf klg k|ltlqmof gb]lvPdf / pknAw 5 eg] @) ld=ln= k|lt s]=hL= z/L/sf] tf}nsf b/n] u|'k ldNg] /ut jf cf]

g]u]6e (O Rh - negative) Packed Red Blood Cells -!) Id=nL=÷s]=hL=\_  
lbg'kb{5 .

Hypothermia afnaflnsfd f x'g] d'Vo ;d:of xf] . pgLx?n] 6fpsf]af6 w]/}  
dfqfdf tfk u'dfpF5g\ . ;a} k|sf/sf t/n kbfy{ (Fluid) x? Gofgf]  
u/fpg'kb{5 . afnaflnsfd f z/L/sf] volume sf] t'ngfdf Surface area a]9  
x'g] x'Fbf z/L/sf] tfkqmd sd x'g] (Hypothermia) ;d:of a9L cfpF5 .  
afnaflnsfno{ o:tf] cj:yfdf hfFr sf] nflu z/L/ v'Nnf ug{ cfjZos x'G5  
t/ t'?Gt} sk8fn] 5f]Kg' kb{5 .

**;Dej ePdf aRrfno{ Gofgf] x'g] u/L / kl/jf/sf ;b:ox?sf] glhs  
/flvg' k5{ .**

**gf]6 M =====**

## ue{jtL (Pregnancy)

ue{jtL dlxnf / cGo dlxnfd r]6k6s kl5 ul/g] A-B-C-D-E Joj:yfkg k|fyldstfx? Ps} lsl;dsf] x'G5 .

ue{jtL dlxnfd z/L/sf] anatomical / Physiological kl/jt{g x'G5, h'g r]6k6s nfu]sf ue{jtL dlxnfsf] n]vfhf]vfd clt dxTjk'0f{ x'G5 .

### **z/L/sf] ;+/rgfTds kl/jt{g (Anatomical changes)**

- kf7]3/sf]] cfsf/ a9\b} hfG5 h;n] ubf{ To;df Blunt tyf 5fnf 5]l8g] jf 3f]lrg] (Penetrating) 3fp x'g] hf]lvd a9L x'G5 .
  - ue{sf] !@ cf}+ xKtfd Fundus, Pubic Symphysis df cfPsf] x'G5 .
  - @) xKtfd Umbilicus ;Dd cfO{k'U5 .
  - #^ xKtfd Xiphoid ;Dd k'U5 .
- klxnf] r/0fdf e|'0fnfO{ df]6f] leQf ePsf] kf7]3/ / w]/} dfqfsf] Amniotic fluid n] ;'/lff ub{5 .

### **zf/LI/s k|0ffnLsf] kl/jt{g (Physiological changes)**

- Tidal volume / respiratory alkalosis a9\g' .
- d'6'sf] w8sg a9\g' .
- Cardiac output #)Ü n] a9\g' .
- k|foM /Qmrk 15mm Hg n] 36\g' .
- Third Trimester df kf7]3/sf] bafjn] k]6sf] d'Vo /QmgnLdf rfk k}bf x'g] (Aortocaval Compression) / /Qmrk sd (Hypotension) x'g' .

### **ue{jtL dlxnfd r]6k6ssf ljz]if ;jfnx?**

Blunt Trauma sf sf/0f lgDg cg';f/sf cj:yfdf cfpg ;S5 M

- kf7]3/df lk8f x'g' (Uterine irritability) / ;do gk'lusg} Joyf nfUg" (Premature labour)
- kf7]3/sf] s]xL efu jf ;Dk"0f{ efu Rofltg' jf km'6\g' .
- ;fngfn k'/} jf s]lx efu dfq 5'l\$g' - r]6 nfu]sf] \$\* 306f ;Dd \_
- Pelvis efFIRrPsf] 5 eg] w]/} dfqdf /Qm>fj x'g] s'/f tkm{ Wofg lbg'xf];\ .

## klfyldstfx? s] s] x'g\ <

- A-B-C-D-E lg/Llf0fsf] cfwf/df ue{jtL dlxnfsf] cj:yfsf] n]vfhf]vf ug'{xf];\ .
- Aorto-caval Compression x'g glbg left lateral position df Resuscitate ug'{kb{5 .
- /Qm>fj ePsf] / kf7]3/sf] d'v v'n] gv'n]sf] kQf nufpg Speculum k|of]u u/L of]gLsf] hfFr ug'{xf];\ .
- Fundal height and tenderness af/]df hfFr ug'{xf];\ / e|'0fsf] d'6'sf] w8sg plrt b/df ePsf] 5÷5}g cg'udg (Monitor) ug'{xf];\ .

cfdfs] Resuscitation n] aRrfsf] Hofg aRg ;S5 . t/ s'g} kl/l:yltf  
cfdfs] Hofg hf]lvddf x'g;S5 / cdfnfO{ hf]ufpg e|'0fnfO{ Tofu  
ug'{kg}{ x'g ;S5 .

|  |
|--|
| <p><b>Rff]6k6s nfu]sf ue{jtL dlxnfnfO{ Resuscitate ubf{ Aortocaval<br/>Compression x'gaf6 hf]ufpg'k5{ . lj/fdLnfo afofF tkm{ 9Nsfpg'</b></p> |
|--|

## 89]sf] ÷ kf]n]sf] (Burns)

89]sf] ij/fdLnfo{ klg cGo rf]6k6s nfu]sf] ij/fdL h:t} k|fyldstf ckgfOG5 .

**nf]vfhf]vfM Zjf;dfu{, Zjf;k|Zjf;lqmf -;f; InPsf] / ;f; km]bf{sf] cj:yfaf/] ;fjwfgL ckgfpg' kb{5\_, /Qm;~rf/ -t/n kbfy{ k'g:yf{kgf\_ / z/L/nfo{ v'Nnf kfg' (hn]sf] k|ltzt kQf nufpg Exposure ug]{ )**

89]sf] sf/0f dxTjk'0f{ x'G5 . h:t}M cfuf], tftf]kfgL, d§Ltn, Kof/flkmg cflb kQf nufpg' dxTjk'0f{ x'G5 . ljB'tLo s/]G6åf/f ePsf] kf]nfO ;fdfGo b]lvPsf] eGbf uDeL/ x'G5 .

**ofb /fv'g'xf];M lft ePsf] 5fnf / df+;k]zLn] ubf{ Acute renal failure x'g ;Sb5 .**

## Jo:yfkgf cTofjZos pkfox?

- cem a9L kf]Ngaf6 /f]Sg'xf];\ .
- A-B-C-D-E lg/Lif0f u/L, kf]n]sf] efusf] k|ltzt olsg ug'{xf];\ . (Rule of 9's k|of]u ug'{xf]; . \_
- I/V Access sf] /fd]f] Joj:yf u/L oyfzL3| Fluid Replacement ug'{xf];\ .

## 89]sf] ÷ kf]n]sf] ij/fdLx?sf] ljz]if ;jfnx?

tn plNnlvt l;4fGtx?nfO{ cfwf/ dfgL kf]n]sf] ij/fdLdf x'g] Zjf;k|Zjf;sf] ;d:of kQf nufP/ Joj:yfkg ug{ ;lsG5 .

- d'v j/k/ kf]n]sf]
- cg'xf/df kf]n]sf] jf cg'xf/ tyf gfsssf] /f)+ 89]sf]
- :j/ wf]qf] x'g' (Hoarseness) / vf]sL nfUg' (Rasping cough)
- 3fF6L leq ;'lgP/ 7"nf] x'g' (glottic oedema)
- 5ftL jf 3fF6Lsf] ;Dk"0f{ jf s]xL efu kf]n]sf]

olb la/fdLsf] :j/ wf]qf] ePdf, y's lgNg g;Sg] ePdf / tftf] w'jfFn] Zjf; dfu{df rf]6 nfu]sf] (Inhalation) Oltxf; ePsf]sf] Zjf;k|Zjf;sf] b/ a9]df Naso tracheal intubation pkrf/ ug'{kb{5 .

/Qm;~rf/ / lkz]f] lg:sf;g (Renal Output) cfjZos dfqdf Joj:yt ug{ la/fdLnfo{ s]Dtdf @-\$ ld=nL= Crystalloid 3]n k|lt s]hL z/L/sf] tf}n k|lt 89]sf] efusf] k|ltzt cg';f/ (2-4 ml x Body Weight x % of Burn) k|yd

@\$ 306fleq k|of]u ug'{}kb{5 . To;kl5 cg'dflgt lbg' kg]{ t/n kbfy{sf] (Fluid) dfqf tn lbOP cg';f/ ug'{}kb{5 .

- cg'dflgt Fluid sf] cfwf efu Kff]n]sf] \* 306f leqdf lbg'kb{5 .
- cf];t lkzfjsf] b/ )=%-! ld=ln=÷s]hL÷306f agfpg afFsL cfwL efu Fluid!^ 306f leq lbg'kb{5 .

**olb ;Dej ePdf IgDg pNn]lvt sfo{x? ug'{}kb{5 .**

- b'vfO{ sd ug'{}kb{5 .
- olb kf]n]sf] dfqf @)Ü eGbf a9L eP Bladder Catheterisation ug'{}kb{5 .
- Nasogastric drainage
- Tetanus Prophylaxis

**Inhalation Injury sf nlf0fx? klxnf] @\$ 306f;Dd gb]lvg**

## 3fO{t} lj/fdLx?sf] cf];f/k;/

(Transport of critically ill patients)

3fO{t} lj/fdLsf] offfoft vt/fk'0f{ x'G5 . o;sf nflu k|efjsf/L ;+rf/, pko'Qm of]hgf / pko'Qm sd{rf/Lsf] cfjZostf kb{5 . s'g} Ps 7fpFaf6 csf]{ 7fpFtkm{ n}hfg' kg]{ la/fdLnfo{ xnrn gx'g] u/L l:y/ ul;/s]kl5 dfq n}hfg' kb{5 . ;fdfGo dfGotf cg';f/ la/fdLnfo{ To:tf] 7fpFdf dfq nlug' k5{ hFxf dflyNnf] txsf] ;]jf k|bfg ul/G5 .

### of]hgf agfpFbf / tof/L ubf{ Wofg lbg'kg]{ s'/fx?

- offfoft jf ;jf/Lsf] lsl;d -sf/, hLk,8'Ef cflb\_
- la/fdL;Fu hfg] JolQm
- ;fdfGo / cfsl:ds l:yltf af6f]df cfjZos kg]{ ;fdfg, cf}hf/ tyf cGo a:t'x?
- ;Defljt hl6ntfx? (Complications)
- la/fdLsf] cg'udg (Monitoring) / Final packaging

### k|efjsf/L ;+rf/sf] cfjZostf kg]{ JolQm÷7fpFx?

- lj/fdL k'Ug] c:ktfn÷:jf:Yo sfof{no
- offfoft ;]jf
- la/fdLsf] /]vb]v ug]{ JolQm
- la/fdL / p;sf cfmGtx?

### la/fdLnfo{ k|efjsf/L ?kdf l:y/ kfg{ ug'{kg]{ sfo{x? M

- t'?Gt Initial resuscitation ug{'
- /Qm>fj /f]Sg' / /Qm;~rf/ ;'rf? u/fpg'
- efFIRrPsf] 7fpFx? xnrn gu/fO{ /fVg'
- Analgesia

### ofb /fVg'xf];\

olb la/fdLsf] cj:yf lalulPdf, k|f/IDes lg/Llf0f u/L k'gM d"Nof+sg ug{'xf];\ . Hofg hf]lvddf kg{ ;Sg] la/fdLsf] cj:yfnfo{ yk lau|gaf6 /f]Sg'xf];\ / pkrf/x? ug{'xf];\ . To;kl5 k|efljt efu / k|offnLnfo{ s]lGblt u/L ;fjwfgLk"}j{s n]vfhf]vf ug{'xf];\ .

### gf]6\; M

### tof/ /xg'xf]; M



# cg';"rL !

## Zjf; gnLsf] Joj:yfkgsf ljwLx?

(Airway management techniques)

### cfwf/e't ljwLx? (Basic Techniques)

lrpF8f] prfNg'xf];\ / aË/f prfNg'xf];\ . (Chin lift and jaw thrust)

lrpF8f] prfNg] sfo{ ug{sf] nflu b'O{j6f cf}+nfx? lrpF8f] (Mandible)  
d'lg /fVg'xf];\ / lrpF8f]nfO{ cl3INt/ Nofpg la:tf/} dflytkm{  
prfNg'xf];\ . o:tf] sfo{ ubf{ 3fF6LnfO{ cTolws tGsfpg' x'Fb}g . -  
k|of]ufTds slffdf b]vfOg]5\_

aË/f prfNbf klg Mandible sf sf]0fx?nfO{ b'O{j6f xftsf] ;xfotfn]  
la:tf/} dflytkm{ prfNg' kb{5 o;f] ubf{ Zjf; gnL l;wf x'G5 . -  
k|of]ufTds slffdf b]vfOg]5\_  
ofb /fVg'xf];\ oL e/kbf{ ljwL eg] xf]Ogg\ / Zjf;gnLdf cj/f]w h'g;'s]  
a]nfdk klg cfpg ;Sb5 .

### Oropharyngeal airway

Oral airway lha|f]sf] k5f8L / k|foh;f] dfly 7]Nb} tnlt/ 3';fOG5 . of]  
k|ls|of g/d tfn" ;Fu gnL g7f]lsGh]n;Dd u/LG5 / To;kl5 gnLnfO{  
!\*) sf] sf]0fdf 3'dfOG5 . afnaflnsfdf o;f]ubf{ ;fjwfgL ckgfpg' kb{5  
lsgsL o;n] pgLx?sf] g/d tGt'df xfgL k'¥ofpg] ;+efjgf x'G5 .

### Nasopharyngeal airway

o; ljlwdf gnLnfO{ gfssf] Kjfnaf6 3';fOG5 -gnL /fd|f] ;Fu lrKnf]  
kf/LPsf] x'g'k5\_ / oropharynx sf] k5f8Lsf] efu;Dd k'\_ofOG5 . of]  
t'ngfTds ?kdf la/fdLnfO{ ;lhnf] x'g] ljlw xf] .

## ppRr ljwLx? (Advanced Techniques)

### Orotracheal Intubation

oLb ;fjwfgLk"}{s of] sfo{ ug{ ;lsPg eg] o;n] Cervical Hyper-extension x'g;S5 . lj/fdLnfO{ xnrn gu/fOsg l;wf /]vfdl l:y/ u/fpg -Ps hgf ;xof]uLsf] d2tn]\_ clt cfjZos x'G5 -k|of]ufTds slffdf k|:t't ul/g]5\_ . oLb k]6 e/L ePsf] z+lf nfu]df Cricoid Pressure klg cfjZos x'g;S5 . skmnfO{ (Cuff) k"0f{ ?kdf k'mnfp' (Inflated) kb{5 / gnL 7Ls 7fpFdf 5÷5}g eg]/ b'j} kmf]S;f]sf] Zjf;k|Zjf;sf] cfjfhaf6 kSsf ug{ k5{ .

**ofb /fVg'xf]; M cg'xf/ / 3fF6Ldf rf]6k6s nfu]sf  
la/fdLx?df Zif:anLdf ci/flw x'a1 hflldv x'G5 .**

**IgDg cj:yfx?df** Tracheal intubation **ug}{ kg}{ x'G5 .**

- Zjf;gnL v'nf /fVg / aspiration af6 /f]Sg
- df:s k|of]u u/L / Zjf;gnLaf6 l;w} clS;hg lng g;s]sf] cj:yfdf clS;hg lbg .
- s[lqd Zjf;k|Zjf; (Ventilation) lbg / Hypercarbia /f]Sg .

oL ;Dk"0f{ sfo{x? #) ;]s]08leq ug'{kb{5 . oLb 6\o'a /fVg (Intubation) g;lsPdf s[lqd Zjf;k|Zjf; (Ventilation) hf/L /fVg' kb{5 .

**ofb /fVg'xf];\ lj/fdL Zjf;gnLdf /flvg] 6\o'asf] cefjn] geO{  
clS;hgsf] cefjn] db{5 .**

### Surgical Cricothyriodotomy

of] To:tf] cj:yfdf ul/G5 h'ga]nfdl 6\o'a /fVg] (Intubation) sfo{ c;kmn x'G5 / s[lqd Zjf;k|Zjf; ls|of (Ventilation) la/fdLnfO{ u/fpg ;ls+b}g . Cricothyroid membrane 5fd]/ yxf kfp'g ;lsG5 . 5fnfdl ;fg] Kjfn agfP/ Cricothyroid membrane x'Fb} Kjfn agfOG5 . KjfnnfO{ km/flsnf] agfpg Artery forcep sf] k|of]u ul/G5 / To;kl5 \$-^ cfsf/sf] Endotracheal tube jf small tracheostomy tube leq 3';fOG5 .

gf]6\; M===

## cg';"rL @ Paediatric Physiological Values

| Variable                   | Newborn   | 6 months | 12 months   | 5 years | Adult       |
|----------------------------|-----------|----------|-------------|---------|-------------|
| Respiratory rate (b/min)   | 50 ± 10   | 30 ± 5   | 24 ± 6      | 23 ± 5  | 12 ± 3      |
| Tidal volume (ml)          | 21        | 45       | 78          | 270     | 575         |
| Minute ventilation (L/min) | 1.05      | 1.35     | 1.78        | 5.5     | 6.4         |
| Hematocrit                 | 55 ± 7    | 37 ± 3   | 35 ± 2.5    | 40 ± 2  | 43 - 48     |
| Arterial pH                | 7.3 - 7.4 |          | 7.35 - 7.45 |         | 7.35 - 7.45 |

| Age      | Heart rate range | Systolic blood pressure<br>(beats per minute) |
|----------|------------------|---|
| (mmHg)   |                  |   |
| 0-1 year | 100-160          | 60-90   |
| 1 year   | 100-170          | 70-90   |
| 2 years  | 90-150           | 80-100  |
| 6 years  | 70-120           | 85-110  |
| 10 years | 70-110           | 90-110  |
| 14 years | 60-100           | 90-110  |
| Adult    | 60-100           | 90-120  |
|          |                  |   |

| Respiratory Parameters and Endotracheal Tube Size and Placement |             |                          |          |                 |                  |
|---|-------------|--------------------------|----------|-----------------|------------------|
| Age   | Weight (kg) | Respiratory Rate (b/min) | ETT size | ETT at Lip (cm) | ETT at Nose (cm) |
| Newborn   | 1.0-3.0     | 40-50                    | 3.0      | 5.5-8.5         | 7-10.5           |
| Newborn   | 3.5         | 40-50                    | 3.5      | 9               | 11               |
| 3 months  | 6           | 30-50                    | 3.5      | 10              | 12               |
| 1 year  | 10          | 20-30                    | 4.0      | 11              | 14               |
| 2 years   | 12          | 20-30                    | 4.5      | 12              | 15               |
| 3 years   | 14          | 20-30                    | 4.5      | 13              | 16               |
| 4 years   | 16          | 15-25                    | 5.0      | 14              | 17               |
| 6 years   | 20          | 15-25                    | 5.5      | 15              | 19               |
| 8 years   | 24          | 10-20                    | 6.0      | 16              | 20               |
| 10 years  | 30          | 10-20                    | 6.5      | 17              | 21               |
| 12 years  | 38          | 10-20                    | 7.0      | 18              | 22               |

## cg';"rL # Cardiovascular pulmonaries

| Blood loss        | Heart rate | Blood pressure  | Capill refill | Resp rate | Urine volume | Mental state      |
|-------------------|------------|-----------------|---------------|-----------|--------------|-------------------|
| Up to 750 ml      | < 100      | normal          | normal        | normal    | > 30 mls/hr  | normal            |
| 750-1500 ml       | > 100      | systolic normal | positive      | 20-30     | 20-30        | mild concern      |
| 1500-2000 ml      | > 120      | decreased       | positive      | 30-40     | 5-15         | anxious/ confused |
| More than 2000 ml | > 140      | decreased       | positive      | > 40      | < 10         | confused / coma   |

## cg';"rL \$ Glasgow Coma Scale

| Function   | Response                        | Score |
|------------|---------------------------------|-------|
| Eyes (4)   | Open spontaneously              | 4     |
|            | Open to command                 | 3     |
|            | Open to pain                    | 2     |
|            | None                            | 1     |
| Verbal (5) | Normal                          | 5     |
|            | Confused talk                   | 4     |
|            | Inappropriate words             | 3     |
|            | Inappropriate sounds            | 2     |
|            | None                            | 1     |
| Motor (6)  | Obeys command                   | 6     |
|            | Localises pain                  | 5     |
|            | Flexes limbs normally to pain   | 4     |
|            | Flexes limbs abnormally to pain | 3     |
|            | Extends limbs to pain           | 2     |
|            | None                            | 1     |

# cg';"rL % Cardiac Life Support

lj/fdL / cfkm\gf] ;'/lffsf] lglZrt ug'{xf];

Responsiveness hfFr  
uα{xf].

5

Rff]6k6ssf] hfFr tyf  
pkrf/ ug]{

5}g

Zjf;dfu{ v'Nnf ug]{ -  
j+uf/f prfNg]\_

Zjf;k|Zjf; hfFr ug]{

5

Recovery Position df  
/fVg]

b'O k6s k|efjsf/L Zjf;  
lbg]

/Qm;+rf/ hfFr ug]{

5

Zjf;k|Zjf; (Rescue Breathing) lbO  
/fVg] !) k|lt ldg]6

5}g

Chest Compression z'?  
ug]{  
-j+uf/f prfNg]\_  
!)) k|lt ldg]6 #)M@ -@  
JolQm ePdf\_

-a+uf/f prfNg]\_ k|To]s  
ldg]6df /Qm;+rf/ hfFr ug]{ .  
s'g} lrGx gb]lvPdf Chest  
Compression z'? ug]{ .

## cg';"rL ^ Trauma Response

Long before any trauma patient arrives in your medical care, roles must be identified and allocated to each member of the trauma 'team'

Team members (depends on availability)

Ideally:

- On-duty emergency doctor or experienced health worker (team leader)

| Trauma Team roles                               |   |
|---|---|
| Team leader (Doctor)                            | (Nurse)                                 |
| 1. Co-ordinate ABC's                            | 1. Help co-ordinate early resuscitation |
| 2. History – patient or family                  | 2. Liaise with relatives                |
| 3. Request X-rays (if possible)                 | 3. Check documentation including:       |
| 4. Perform secondary survey                     | - allergies                             |
| 5. Consider tetanus prophylaxis and antibiotics | - Medications                           |
| 6. Reassess patient                             | - Past history                          |
| 7. Prepare patient for transfer                 | - Last meal                             |
| 8. Complete documentation                       | - Events leading to injury              |
|   | 4. Notify nursing staff in other areas  |

- On-duty emergency nurse
- 1 or 2 additional helpers

When the patient actually arrives, a rapid overview is necessary.

This is known as TRIAGE.

This rapid overview prioritizes patient management according to:

- manpower
- resources

This will be discussed at length during the course

# cg';"rL & rf]6k6s Joj:yfkg ;d"xsf] sfo{of]hgf (Activation plan for Trauma Team)

## cfwf/x? (Criteria)

lgDg cg';f/ b]lvPsf la/fdLx?nfO{ k"Of{?kn] rf]6k6ssf] n]vfhf]vf  
ug'{kb{5 .

## O{ltxf; (History)

- # ld6/eGbf al9 prfOFaf6 n8]sf]÷v;]sf]
- b'3{6gf x'Fbf ;jf/Lsf] ult #) lsdL k|lt306f eGbf a9L ePsf]
- ;jf/Laf6 v;]sf] jf ;jf/L ;fwg leq RoflkPsf]
- 36gf:yndf g} s'g} JolQmsf] dTo' ePsf]
- a6'jf, ;fOsndf ;jf/ jf plePsf] JolQmnfO{ ;jf/Ln] 7Ss/ lbPsf]

## hfFr (Examination)

Zjf;gnL jf Zjf;k|Zjf;df sl7gfO{

- /Qmrfk 100 mm HG eGbf sd x'g'
- Glasgow Coma Scale !#÷!% eGbf sd
- ! eGbf a9L efudf rf]6 nfUg'
- 5]l8g] rf]6k6s nfu]sf]



## k|sf]k Joj:yfkg (Disaster Management)

ljkb jf k|sf]k b'3{6gfx? s'g} klg a]nf 36\g ;Sb5g\ . ljkb jf k|sf]ksf] nflu agfOg] of]hgf s'g} klg rf]6k6s Joj:yfkgsf] dxTjk"Of{ efu xf] .  
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- k|sf]ksf] gd"gf cEof;
- k|sf]k Joj:yfkgsf] Protocol df lgDg s'/fx? ;dfj]z ug{'k5{ .
  - 36gf :ynsf] Joj:yfkg
  - d'Vo JolQmx?sf] klxrfg
  - 3fOtsf] k|fyldsLs/Of (Trauma Triage)
- c:ktfnaf6 :jf:YosdL{ 6f]nL v6fpg]
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  - ;xof]u tyf /fxt k'¥ofpg] ;+:yfx?
- 3fOt]x?nfO{ 36gf :ynaf6 aflx/ Nofpg] k|fyldstfsf] ;'rL (Evacuation Priorities)
- 3fOt]x?nfO{ 36gf :ynaf6 aflx/ Nofpg rfxg] ;'ljwfx? (Evacuation Facilities)
- oftfotfsf] Joj:yf -;8s, xjfO{, hn dfu{
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o;sf af/]df k|of]ufTds slffdf cem ;dLlff ul/g]5 .

Primary Trauma Care Manual sf] d'Nofíg M  
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| Lecture sf ljfoa:t'                        |   |   |   |   |    |   |
| p2]Zo k flKt ePsf]                         |   |   |   |   |    |   |
| tkfOsf] eljiosf] cEof;sf] nflu<br>pkof]uL  |   |   |   |   |    |   |
| tkfOsf] at{dfg cEof;sf] nflu<br>pkof]uL    |   |   |   |   |    |   |
| clt w]/} hfgsf/Lx?                         |   |   |   |   |    |   |
| ;xof]uL pbfx/Ofx?                          |   |   |   |   |    |   |
| ;xof]uL dGr                                |   |   |   |   |    |   |
| clt la:t[t hfgsf/Lx?                       |   |   |   |   |    |   |
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| <b>;ljwfx?</b>                             |   |   |   |   |    |   |
| <b>cGo k ltlqmofx?</b>                     |   |   |   |   |    |   |

# zAbfy{x?M

## यस पु तकमा योग भएका के ह मह वपूण श दह को अथ

|                                 |   |
|---------------------------------|---|
| Abduction                       | श ररको म य रेखाबाट अंगलाई टाढा लैजाने                               |
| Agitation                       | छ पट, तनाव त हुनु   |
| Analgesia                       | दुखाई कम गर्न औषध   |
| Aortocaval Compression          | गभवती अव थामा पेटमा रहेको एवटा धमनीमा चाप पनु                       |
| Brachial Plexus                 | मे द डबाट घाँट र हात तर जाने नायु नशाह                              |
| Callus                          | भाँ चएको हाडमा पलाउने calcified tissue                              |
| Cardiac Tamponade               | चोटपटकको कारण गदा मुटुमा दवाव पैदा हुनु                             |
| Compartment Syndrome            | मांशपेशी सुनिएर नल मा दवाव पैदा भै र वाह अव हुनु                    |
| Cricothyroidotomy               | आकस्मिक अव थामा cricothyroid membrane मा वाल पारेर वासनल खोने वध    |
| Decompress                      | फो सो तथा पेट भ को चापलाई कृ म तर काले कम गर्न वध                   |
| Disability                      | शार रक अस मता   |
| Diuresis                        | पशाबको उ पादन बढाउने या   |
| Expansion                       | अँगको आकार ब ता रत हुने   |
| Exposure                        | बरामीको सबै लुगा खोलेर शर रलाई खु ला पान                            |
| Extension                       | शर रको अँगलाई जोन बाट टाढा त काउनु                                  |
| Flail Chest                     | करड भाँ चन गै सास फेदा देखा पन छा तको असामा य चाल                   |
| Flexion                         | शर रको अँगलाई जोन तफ खु याउनु                                       |
| Gag Reflex                      | मुखको भी भागमा बा व तु छराउँदा वाक् वाक् हुने                       |
| Haemodynamic Instability        | शर रमा रहेको तरल पदाथह को मा ामा असमानता आउनु                       |
| Haemoperitonium                 | पे रटो नयममा रगत ज नु   |
| Haemothorax                     | फो सो भ रगत ज नु  |
| Hemiparesis                     | शर रको एकातफ मा कमजोर हुनु वा चलाउन नस नु                           |
| Hypercarbia                     | रगतमा कार्बन डाईअ साईडको मा ा असामा य पमा ब ढ हुनु                  |
| Hypocapnia                      | रगतमा कार्बन डाईअ साईडको मा ा असामा य पमा कम हुनु                   |
| Hypoperfusion                   | या पलर ह बाट अँगमा रगतको बहाव कम हुनु                               |
| Hypotensive Fluid Resuscitation | Hypotension लाई सामा य बनाउन शर र भ तरल पदाथ वेश गराउनु             |
| Hypovolaemia                    | शर रमा कोषह मा तरल पदाथको मा ा कम हुन जानु                          |
| Hypoxia                         | शर रमा कोषह मा अ सीजनको मा ा कम हुन जानु                            |
| In-line Immobilization          | शर रका अँगलाई ज ताको त तै अव थामा रहने गर हलचल नहुने क समले अ याउनु |
| Intercostal Drainage            | Intercostal space बाट छा तमा जमेको तरल पदाथ बा हर नका ने त रका      |
| Intubation                      | सास फेराउन सजिलो बनाउनको ला ग घाँट मा पाईपको योग गर्न त रका         |
| Ischaemia                       | कोषह मा अ सीजनको मा ा कम हुन जानु                                   |
| Maxillofacial                   | माजिला र अनुहरसँग स बधित  |

|                        |   |
|------------------------|---|
| Myocardial Contusion   | मायोका डयममा चोट लागेर दे खने मुटुको ग भीर सम या                                  |
| Myocardial Infarction  | मायोका डयममा अ सीजन अपया भै दे खने मुटुको ग भीर सम या                             |
| Nasopharyngeal Airway  | सास फेराउन सजिलो बनाउनको ला ग नाकबाट घाँट मा रा खने पाईप                          |
| Orotracheal Intubation | कृ म वास वासको नति मुखबाट trachea मा tube लगाउने व ध                              |
| Pericardiocentesis     | पे रका डयममा जमेको तरल पदाथ नका नको ला ग ग रने puncture                           |
| Peritoneal Lavage      | पे र टनयम सफा गन व ध  |
| Reperfusion            | र वाह ब द भएको त तुमा पुनः र वाह हुनु   |
| Reflex Tachycardia     | Autonomic nervous system मा आउने ग बडीको कारणले गदा उ प न हुने मुटुको अ नय मत चाल |
| Resuscitation          | बरामीलाई सास फेन सजिलो बनाउने तथा मुटुको चाल यथावत रा को नति अवल बन ग रने व ध     |
| Stridor                | सास नल ब द भएर यार यार हुनु   |
| Suction                | नाक मुख तथा घाँट मा ज मा भएका तरल पदाथ ता ने ब ध                                  |
| Sympathetic Tone       | Sympathetic stimulation ारा शर रमा माँसपे शह मा दे खने चाल                        |
| Tension Pneumothorax   | Pleural cavity मा हावा भ रन गै फो सोमा चाप ब न जानु                               |
| Tracheal Deviation     | Trachea आ नो थानबाट सरेर असामा य अव थामा हुनु                                     |
| Triage                 | बरामी तथा घाईतेह को उपचार गनु अ घ ाथ मकताको आधारमा गि भिरता प हचान गन व ध         |
| Vasoconstriction       | र नल ह साँघुरो हुनु   |
| Ventilation            | बरामीलाई सास फेन सजिलो बनाउने कृ म व ध  |