Patients 1st
The Patient's First Choice

Royal Surrey County Hospital NHS
NHS Foundation Trust

Emergency Laparotomy
Peri-operative Care Pathway

EMERGENCY LAPAROTOMY PERI-OPERATIVE CARE PATHWAY

This pathway should be started for **ALL patients presenting with acute abdominal conditions that may need emergency surgery**. The pathway is designed to provide guidance and improve the peri-operative are of these high risk emergency cases.

Pre-operative information

NHS No.: **Hospital No.:**

Patients Name:

Address:

D.O.B.:

Date of Admission	
Time of Admission	
Admitting speciality	
Admitting Consultant	
Surgical Consultant	
Weight (kg)	
Height (m)	

Risk Factors:

- Ischaemic heart disease ☐
- Congestive cardiac failure ☐
- Respiratory disease ☐
- Renal failure (creatinine >150µmol/l) ☐
- Diabetes Mellitus (requiring insulin) ☐
- Anticoagulants (warfarin, clopidogrel) ☐

Other history:

Nutritional Indices:

Exercise capacity:

Allergies:

Surgical Consult:

Date and time reviewed by surgical team:

.... / .... / .... : ..... Grade .....

Date and time seen by surgical consultant:

.... / .... / .... : .....

Working diagnosis:

.....

.....

Planned procedure:

.....

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Initial management:

Operative ☐ Non-operative ☐

Theatre booking:

Date and time of decison for theatre:

.... / .... / .... : .....

Date and time booked:

.... / .... / .... : .....

Anaesthetist informed ☐

Outreach / ITU informed ☐

NCEPOD classifcation:

Immediate ☐ Urgent ☐ Expedited ☐

ASA 1 2 3 4 5

Anticipated level of post operative care: Bed booked ☐

Level 2/(ITU) ☐ Level 3 (ITU) ☐

Clinician completing pathway (Print and sign)

.....

Bleep number

.....

Designation:

FY1/FY2/CT1-2/ST3+

CSP057321 10/12

PRE-OPERATIVE GUIDE-LINE

PRESUMED OR DIAGNOSED NEED FOR EMERGENCY LAPAROTOMY

Antibiotics with-in 30 min
IV fluids 20ml/kg
O2:35%
ABG Blood cultures, CT scan
Contact Outreach, Anaes, ICU
NaHCO3 1.26%: 3ml/kg/hr for 6hrs

Lactate ± 4 or Sys BP <110

CT scan within 30 min
Consultant Supervision
Surgery within 2 hrs
Theatre

Lactate<4 and Sys BP >110

CT scan within 2hrs
Consultant Discussion
Surgery within 6hrs
Preop-Optimisation
Hourly monitoring
Theatre

Immediate Monitoring

HR, Sys BP, RR, O2 Sat,
ABG, Urine Output
GCS, Temp,
Biochemistry

Pre-Optimisations Goals

O2 Sat >95%
BP MAP>65mmHg,
Lactate<3mmol/L
Urine output 1ml/kg

Pre-operative Management Checklist:

IV Fluid prescribed **AND** administered ☐ Date / Time .... / .... / .... : .....
CIN prophylaxis commenced ☐ Date / Time .... / .... / .... : .....
Antibiotics prescribed **AND** administered ☐ Date / Time .... / .... / .... : .....
Analgesia prescribed **AND** administered ☐ Date / Time .... / .... / .... : .....
Fluid Balance chart started ☐
Urinary catheter inserted ☐
Recent blood results charted ☐
Arterial Blood Gas results charted ☐ Lactate ..... mmol/L
Blood cross-matched ☐
ECG ☐
Chest X-ray - checked and documented ☐
Blood glucose checked and management plan in place ☐
VTE risk assessment completed AND documented on drug chart ☐
VTE prophylaxis prescribed (IF appropriate) **Y** ☐ **N** ☐
Coagulopathy thrombocytopenia present **Y** ☐ **N** ☐
Management plan for coagulopathy in place **Y** ☐ **N** ☐
(refer to Red Book guidelines or on-call haematologist)
Naso-gastric tube inserted (if appropriate) **Y** ☐ **N** ☐

Clinician completing pathway (Print and sign) **Bleep number** **Designation:**

.... **FY1/FY2/CT1-2/ST3+**

Date & time	Additional pre-operative optimisation notes

Date & time	Additional pre-operative optimisation notes

INTRAOPERATIVE GUIDE-LINE

Anaesthetics

Consultant Input
Goal Directed Optimisation
MAP>65mmHg
Warming and Temp Monitoring
Lung protective ventilation
AKI protocol
Electrolytes: K Mg.
Antibiotics:

First check on the pathology system if the patient is known to have previous MRSA or ESBL
If no allergy to penicillin: Tazocin & Gentamicin *
If non-severe penicillin allergy: Meropenem & Gentamicin*
If severe penicillin allergy: Ciprofloxacin + Teicoplanin + Metronidazole + Gentamicin*
If known previous MRSA: Teicoplanin + Tazocin + Gentamicin*
If known previous ESBL: Meropenem + Gentamicin*

*Gentamicin 5mg/kg

Surgical

Consultant input
Wound catheter for local anaesthetic infiltration.

END OF SURGERY GUIDE-LINE

All patients should be transferred to ICU post-operatively.

NOT to Extubate

HR	>100/min
SYSBP	< 110 mm Hg
Norad	>0.2ug/kg/min
Lactate	>3 mmol/L
PaO2	<10kpa on FiO_2 0.5
Temp	< 36 C
NMR	Incomplete reversal

Intra-operative management

To be completed by the anaesthetist in addition to the anaesthetic record

Date and time of induction of anaesthesia

.... / .... : ....

Most senior anaesthetist present
(at any point during the procedure)
CT 1-2 ☐
ST (please specify grade) ☐ .....
Staff grade/Clinical Fellow ☐
Consultant ☐
Consultant Anaesthetist present **Y** **N**

Date and time of induction of anaesthesia

.....

Most senior surgeon present
(at any point during the procedure)
CT 1-2 ☐
ST (please specify grade) ☐ .....
Staff grade/Clinical Fellow ☐
Consultant ☐
Consultant Anaesthetist present **Y** **N**

Goal Directed Optimisation Goals:

SV optimisation (see algorithm on p6)
ScvO2 (>70%)
Oxygen delivery - DO_2I (>600 ml/min/m^2) (see p8)
Lactate (<2 mmol/l)
Haemoglobin (>100 g/l for high risk, >80g/L for low risk)
O2 Sat >95%, PaO2 > 10kpa
Temp: 37±.5C
K: >4 <5.0 mmol/L
Urine output: 0.5ml / kg/hr
Ventilation: PCV, TV: 8ml/kg, I:E ratio:1:1,
PEEP: 5cm of H20

Cardiac Output monitoring used:

Oesophageal doppler ☐
LiDCO rapid ☐

If no CO monitoring used why not?
(e.g. availability, training)
.....

Vasopressor required:

Phenylephrine ☐
Naradrenaline infusion ☐

Inotropes required **Y** **N**

Blood products required
PRC ☐
FFP ☐
Platelets ☐
Cryoprecipitate ☐

Surgical Site Infection Prophylaxis:

Antibiotics: Given prior to induction ☐ Given on induction ☐
Antibiotic regimen reviewed based on surgical findings ☐
Temperature monitoring and appropriate warming techniques ☐

Post-operative plan:

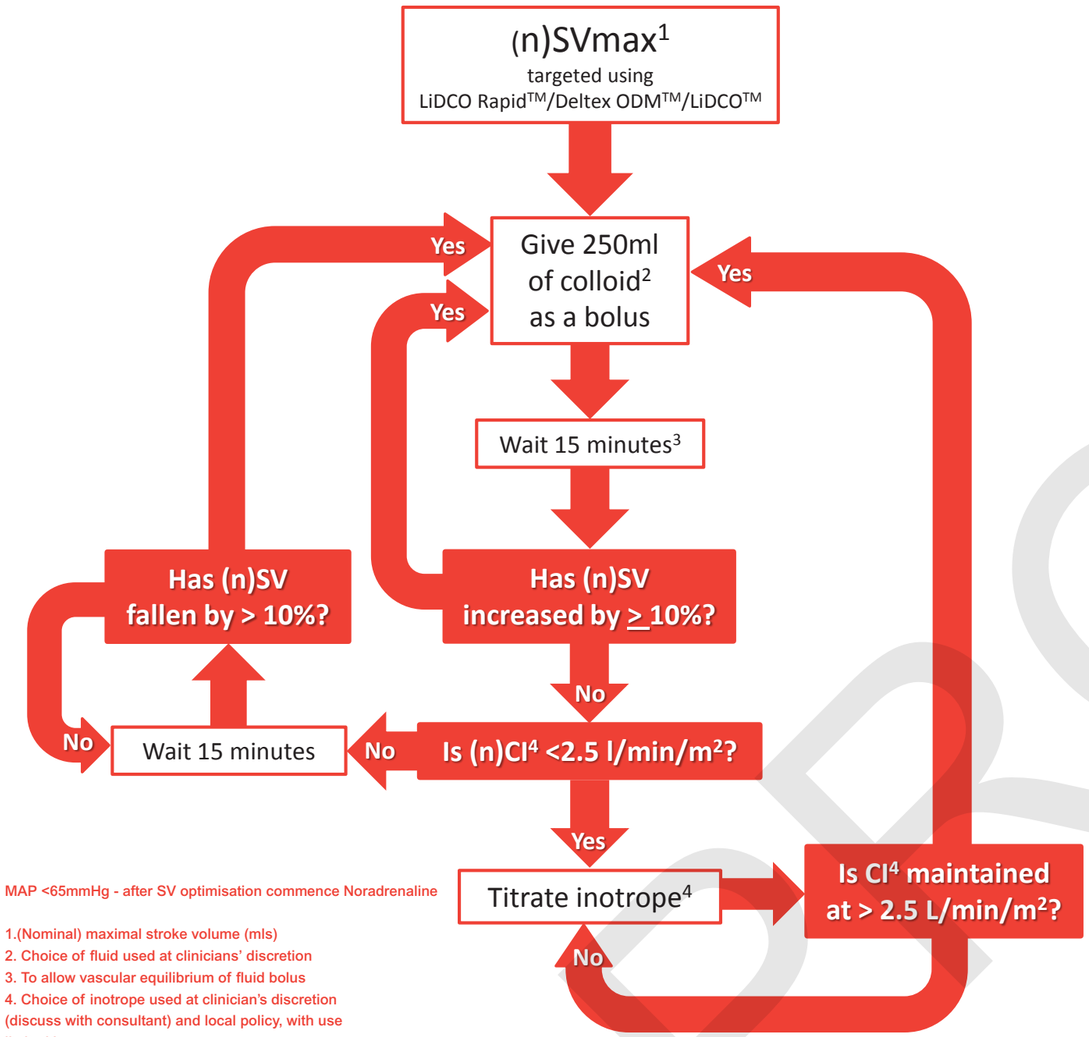
Patient transferred to: Level 3 ☐ Level 2 ☐

Anaesthetist (Print and sign) **Bleep number** **Designation**

.... **FY1/FY2/CT1-2/ST3+/SG/Con**

Goal Directed Therapy Algorithm

Goal Directed therapy using **cardiac output monitoring** (LiDCO rapid™, Deltex™ Oesophageal Doppler Monitor, LiDCO™) should be used to direct fluid, vasopressor and inotrope administration in the peri-operative management of **all emergency laparotomy cases during the peri-operative period and the first 6 post-operative hours**.



MAP <65mmHg - after SV optimisation commence Noradrenaline

1.(Nominal) maximal stroke volume (mls)
2. Choice of fluid used at clinicians' discretion
3. To allow vascular equilibrium of fluid bolus
4. Choice of inotrope used at clinician's discretion (discuss with consultant) and local policy, with use limited by:
   a) Heart rate <120% of baseline
   b) ECG changes
   4. (Nominal) Cardiac index (L/min/m²)

Oxygen delivery calculations:

DO_2i (ml/min/m²) = DO_2 (ml/min) / body surface area (BSA, m²)

BSA (Mosteller formula) = $\sqrt{\text{height (cm) x weight (kg) / 3600}}$

DO_2 = cardiac output (l/min) x ((1.31 x Hb (g/L) x SaO^2) + (0.23 x PaO2 (kPa))

Hospital:

Ward:

Hospital No:

Surname:

First Name:

Date of Birth: Age:

FROM WARD

Date

Operation Proposed

FROM SURGEON OR HOUSE SURGEON

Operation Notes: Surgeon:

Incision: Assistant:

Operative Findings:

Operation Procedure:

Drains: Packs:

TO WARD SISTER

POST-OPERATIVE INSTRUCTIONS:

Operation Sheet

Operation Sheet

Date & time	Operation Sheet - Additional Notes

Hospital:

Ward:

Hospital No:

Surname:

First Name:

Date of Birth: Age:

FROM WARD

Date

Operation Proposed

SURGEON OR HOUSE SURGEON

Operation Notes: Surgeon:

Incision: Assistant:

Operative Findings:

Operation Procedure:

Drains: Packs:

TO WARD SISTER

POST-OPERATIVE INSTRUCTIONS:

Operation Sheet

Date & time	Operation Sheet - Additional Notes

Post-operative management - Level 2/3 (ITU/PACU)

Handover: Anaesthetist to ITU Doctor ☐ Theatre staff to ITU Nurse ☐

Date and time of ITU Admission: .... / .... / .... : .....

Investigations checked and documented:

Admission bloods ☐ ABG ☐ ECG ☐ CXR (central line/NGT placement) ☐

Respiratory management: Aim PaO_2 > 10kPa and $PaCO_2$ < 6kPa

If intubated: ensure ventilation/weaning plan has been discussed with anaesthetist/ITU Consultant

If extubated: early chest physiotherapy if appropriate and hourly ABG monitoring as appropriate

Cardiovascular management:

Aim MAP > 65 mmHg (adjust for hypertension)

Goal Directed Therapy (First 6 Hours)

Cardiac output monitoring with SV optimisation (refer to algorithm on P6)

- $ScVO_2$ (>70%)
- Lactate (<2mmol/l)
- Oxygen delivery - DO_2i (>600ml/min/m^2)
- Hb (>80g/l, >100 if CVS comorbidity)

Fluid management:

- Hartmann/Plasmalyte maintenance 1-1.5 ml/kg/hour in total including enteral feed

Inotrope/vasopressor:

If GDT fails to maintain MAP > 65 mmHg

- Consider starting noradrenaline
- Consider starting inotrope if CI < 2.5 L/min/m2
- Discuss with ITU Consultant if clinical deterioration or any concerns

Hydrocortisone - consider if on-going septic shock / increasing inotrope/vasopressor requirements

Renal management: Aim urine output > 0.5 ml/kg/hour

- Ensure adequate intravascular volume and appropriate MAP sustained with GDT +/- vasopressors/inotropes (as required)
- Consider CVVHF if oligo-anuria and fluid overload / persistent metabolic acidosis / hyperkalaemia (discuss with ITU consultant)

Microbiology:

Antibiotic plan prescribed in accordance with trust guideline ☐

- Consider antifungals if significant intra-operative peritoneal soiling with peritonitis
- If severe refractory sepsis - discuss with on-call ITU/microbiology consultant

General:

VTE prophylaxis - prescribed in line with sugical plan ☐

GI prophylaxis - omeprazole (or alternative) prescribed ☐

Analgesia - post op analgesia plan prescribed and administered with good effect ☐

Metabolic - aim blood glucose 6-11mol/l (insulin sliding scale if necessary) ☐

Nutrition - oral / NG / NJ / TPN feed (follow surgical plan) ☐

Relatives - next of kin contacted (aim early family discussion) ☐

Bleeding/coagulopathy - stop anticoagulants, inform Surgical Registrar, check Hb and coagulation, correct as necessary (discuss with on-call ITU/Haematology Consultant)

Inform Surgical Registrar for urgent review - if bleeding, acute infection, sepsis, cardiac event, acute surgical complications

Clinician completing ITU pathway(Print and sign)	Bleep number	Designation
.....	.....	FY1/FY2/CT1-2/ST3+

Date & time	Post operative notes : ICU

Date & time	Post operative notes : ICU

Date & time	Post operative notes : ICU

Post operative notes : ICU

Date & time	Post operative notes : ICU

Post-operative management - ADU (Level 1)/Wards

This section is to be completed by the surgical team upon return to the ward area from PACU/ITU

Date and time returned to ADU/ward .... / .... / .... : ..... Handover completed ☐

Initial observations:

HR	
BP	
RR	
O_2 sats	
FiO_2	
Temp	
U/O	
EWS	

IV fluids prescribed ☐
Hartmann's maintenance
(1-1.5 ml/kg/hour in total including feed)

Fluid balance chart restarted ☐

VTE prophylaxis prescribed ☐

GI prophylaxis (PPI/ranitidine) ☐

Analgesia prescribed
Epidural ☐
Morphine PCA ☐
Regular / PRN ☐

Nutrition (aim early enteral feeding):
Plan.....
.....
.....
Oral (+/- supplements) ☐
NG/NJ ☐
TPN ☐

Wound Condition
.....
.....
.....
Antibiotics prescribed if required ☐

Post-op investigations:
FBC, U&E +/- LFTs, clotting ☐
$ScvO_2$ (if central line) ☐

Fluid management

Maintenance fluids: Total 1-1.5 ml/kg/hour
Consisting of oral fluids (if not contraindicated) J or IV compound sodium lactate (Hartmann's)

Resuscitation: If systolic BP <90 mmHg give ONE 250mls colloid bows. If no response after 15 mins post administration (provided no congestive cardiac failure) ask for senior review. If BP improves consider repeating.

Replacement of Electrolytes: With appropriate supplements guided by blood test / ABG results (exercise caution with renal impairment).

If the patient develops cardiac failure, or hypotension continues despite fluid resuscitation call Senior team member for urgent review and consider Critical Care Outreach/ITU review

Physiological goals:

HR	**<100**	**>60**
BP systolic	**<160**	**>90**
$ScvO_2$	**>70%**	
U/O	**> 0.5 ml/kg/hour**	

RR	**<20**
Sats O2	**>92% on oxygen**
BM	6-11 mmol/l
Hb	**>80g/L (>100g/L if CVS comorbidity)**

If goals are not being met or EWS is 3 or more - contact senior team member/Outreach/ITU

Clinician completing pathway(Print and sign) ..... **Bleep number** ..... **Designation:** **FY1/FY2/CT1-2/ST3+**

Date & time

ADU/Ward

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:
.....
.....

Nutrition plan review:
.....
.....
.....
☐ Oral ☐
NG/NJ ☐
☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

Discharge plan:
.....
.....
.....

Discharge plan discussed with:
Patient ☐
Next-of-kin ☐
(please document all discussions)

Date & time

Post operative notes : ICU

Date & time

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

.....

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Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

Discharge plan:

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Discharge plan discussed with:

Patient ☐

Next-of-kin ☐

(please document all discussions)

ADU/Ward

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

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Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

Discharge plan:

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Discharge plan discussed with:

Patient ☐

Next-of-kin ☐

(please document all discussions)

GENERAL SURGERY

Date & time

Post operative notes : ICU

Date & time

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

.....

.....

Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

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ADU/Ward

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Nutrition plan review:

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NG/NJ ☐

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Investigations: FBC, U&E, LFT, Coag,

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Next-of-kin ☐

(please document all discussions)

GENERAL SURGERY

Date & time

Post operative notes : ICU

Date & time

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

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Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

Discharge plan:

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.....

.....

Discharge plan discussed with:

Patient ☐

Next-of-kin ☐

(please document all discussions)

ADU/Ward

Fluid balance review ☐

Analgesia review ☐

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(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

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Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

Discharge plan:

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Discharge plan discussed with:

Patient ☐

Next-of-kin ☐

(please document all discussions)

GENERAL SURGERY

Date & time

Post operative notes : ICU

Date & time

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

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Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

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Investigations: FBC, U&E, LFT, Coag,

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(please document all discussions)

ADU/Ward

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

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Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

Discharge plan:

.....

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.....

Discharge plan discussed with:

Patient ☐

Next-of-kin ☐

(please document all discussions)

GENERAL SURGERY

Date & time

Post operative notes : ICU

Fluid balance review ☐

Analgesia review ☐

VTE prophylaxis review

GI prophylaxis review

(consider PPI/ranitidine)

Central line review ☐

Catheter review ☐

Daily mobilisation goals:

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Nutrition plan review:

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☐ Oral ☐

NG/NJ ☐

☐ TPN ☐

Investigations: FBC, U&E, LFT, Coag,

Discharge plan:

.....

.....

.....

Discharge plan discussed with:

Patient ☐

Next-of-kin ☐

(please document all discussions)

Date & time

Date & time

Date & time

Date & time

Post Operative Morbidity Survey

DAY 7

	Criterion	Y	N
Pulmonary	New requirement for supplemental oxygen or other type of respiratory support (e.g. mechanical ventilation or CPAP)	☐	☐
Infectious	Currently on antibiotics or temperature >30ºc in the last 24 hours	☐	☐
Renal	Prescence of oliguria (<500ml/day), increased serum creatinine (>30% from preoperatively), or urinary catheter in place for non-surgical reason	☐	☐
Gastrointestinal	Unable to tolerate enteral diet (either by mouth or feeding tube) for any reason including nausea vomiting or abdominal distension	☐	☐
Cardiovascular	Diagnostic test or therapy within the last 24 hours for any of the following: new myocardial infarction or ischaemia, hypotension (requiring pharmacological therapy or fluid therapy >200ml/hour), atrial or ventricular arrhythmias) or cardiogenic pulmonary oedema	☐	☐
Neurological	Presence of new focal deficity, coma or confusion/delirium	☐	☐
Wound	Wound dehiscence requiring surgical exploration or drainage of pus from the operation wound with or without isolation of organism	☐	☐
Haematological	Requirement for any of the following within the last 24 hours; packed red cells, platelets, FFP, plasma, cryoprecipitate	☐	☐
Pain	Surgical wound pain significant enough to require parenteral opiods or regional analgesia	☐	☐

Peri-Operative SEVERITY Score (P-POSSUM)

Use most recent blood tests and immediate post operative physiological parameters

Age

<61 years ☐

61-70 years ☐

>70 years ☐

Cardiac

No cardiac failure ☐

Diuretic, digoxin, treatment for angina/hypertension ☐

Peripheral oedema, warfarin, borderline cardiomyopathy ☐

Raised JVP, cardiomegaly ☐

Respiratory

No dyspnoea ☐

dyspnoea on ecertion/COPD ☐

Limiting dyspnoea, moderate COPD ☐

dyspnoea at resst, pulmonary fibrosis/consolidation on CXR ☐

ECG

normal ☐

AF, rate 60-90 ☐

any other abnormal rhythm/>4/min ectopics/Q waves/ ST/T changes ☐

GCS ☐☐

Systolic BP ☐☐☐ mmHg

Pulse artenal ☐☐☐ BPM

Hb ☐☐☐ g/dl

WBC ☐☐☐

Urea ☐☐☐ mmol/l

Sodium ☐☐☐ mmol/l

Potassium ☐☐☐ mmol/l

Number of procedures ☐☐☐

Operative blood loss ☐☐☐

Peritoneal contamination

Minor soiling ☐

Local pus ☐

Free bowel contents/pus/blood ☐

Malignancy Y ☐ N ☐

+nodal mets ☐

+distant mets ☐

Operative severity

Major ☐

Complex major ☐