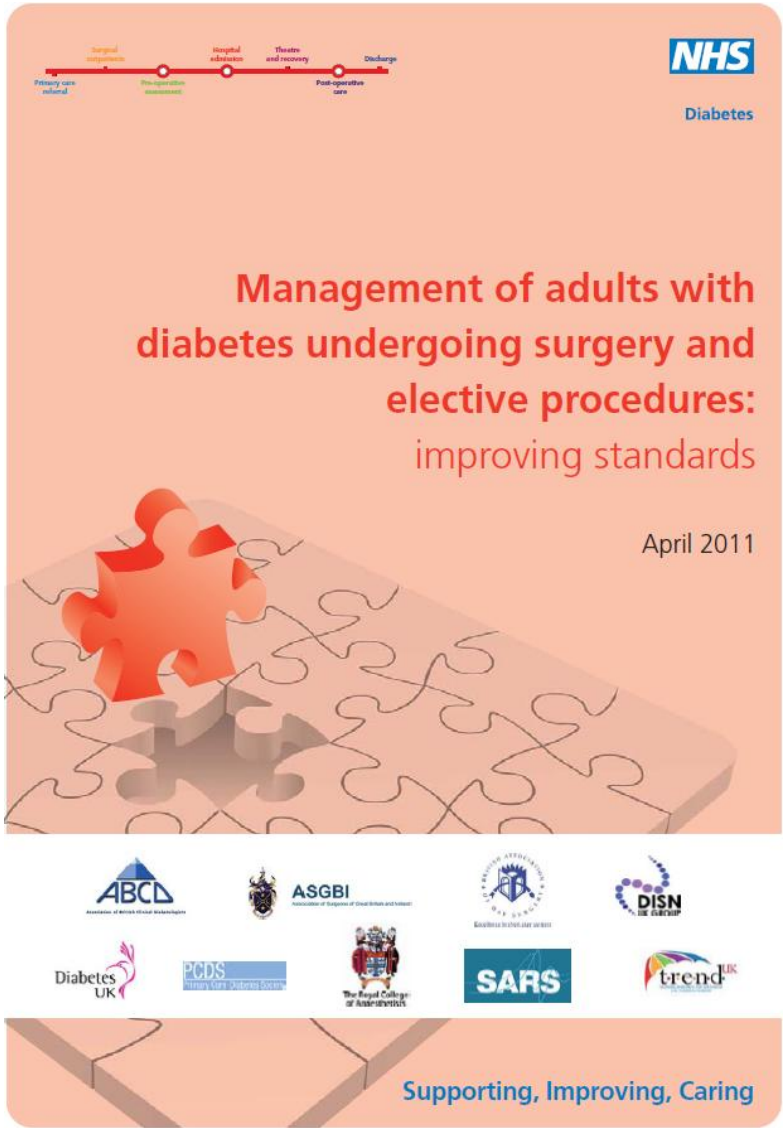
The new NHS Diabetes peri-operative Guidelines

Dr Nicholas Levy
Consultant Anaesthetist
West Suffolk Hospital
Bury St Edmunds
nicholas.levy@wsh.nhs.uk



Aims

1. Implications of Diabetes for the NHS and the patient
2. Current Peri-operative Management of Diabetes
3. Rational for the new guidelines
4. The Care Pathway
5. Controversial Topics

NHS Inpatient Activity

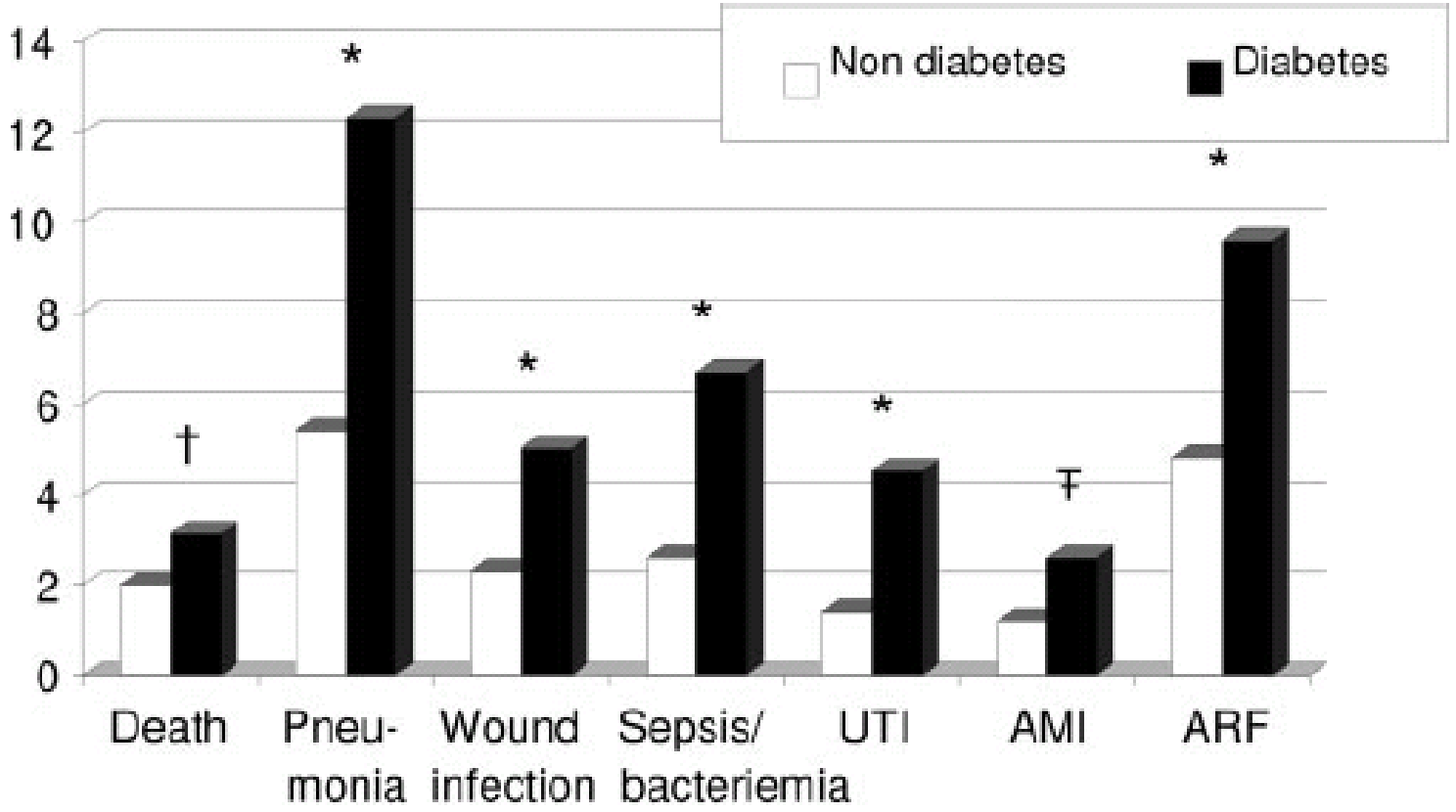
- 5% of the population
- 15% of the inpatient population
- Length of stay is 20% longer than peers
- Median LOS 8 days vs 5 days
- 60% higher re-admission rate
- 10% less DSU than expected

diabetes
Health Intelligence

National Diabetes
Inpatient Audit 2010

Implications of Diabetes for the surgical patient

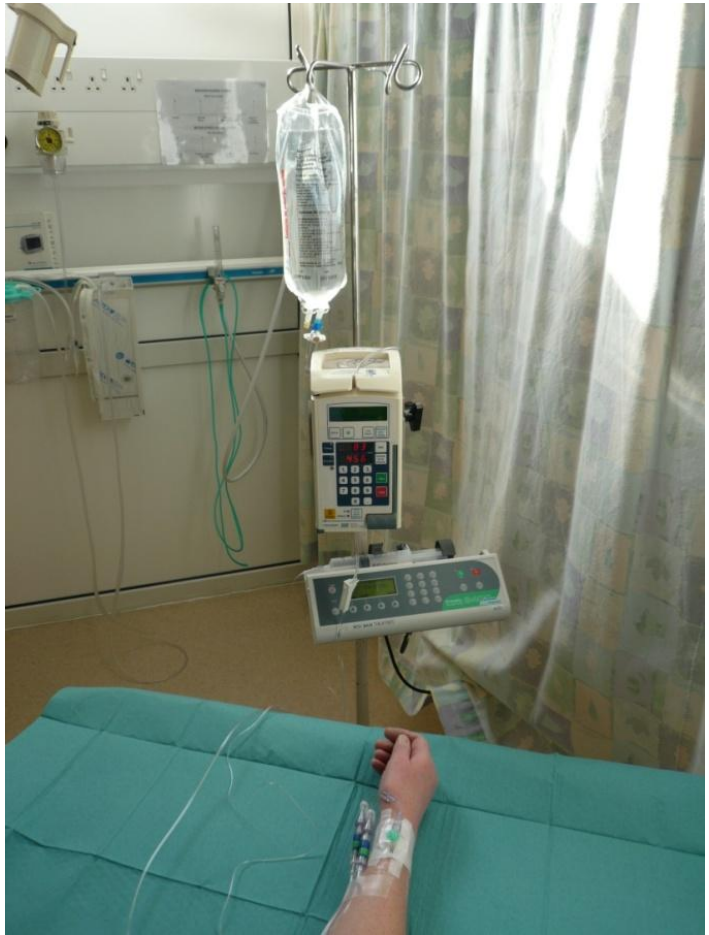
High Peri-op Glucose M&M



3,184 unselected non-cardiac surgical patients in Atlanta, GA

Frisch A et al Diabetes Care 2010;33(8):1783-1788

Current Peri-operative Management of Diabetes



The Alberti GIK Regime

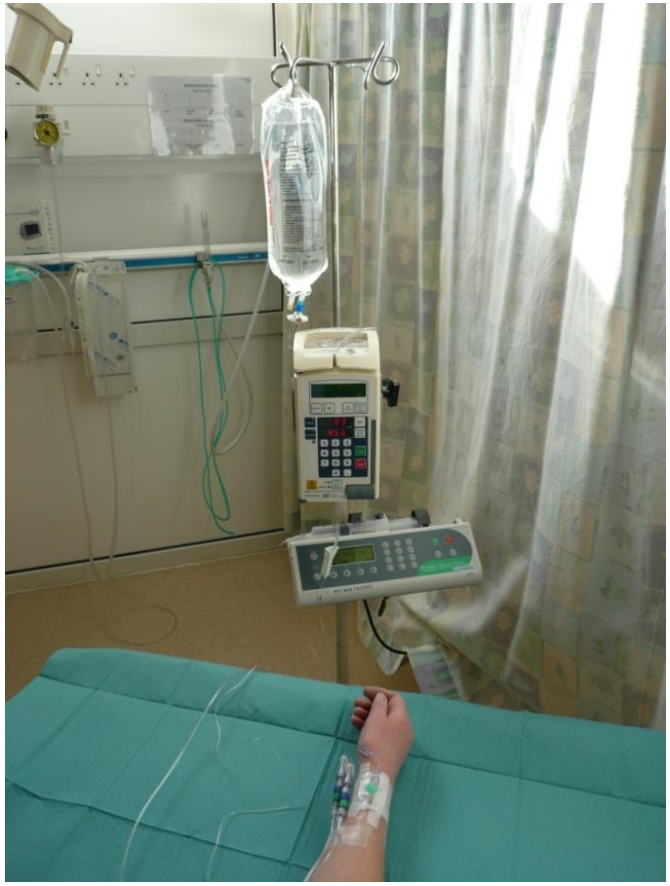
- Evidence based
- It worked and was intrinsically safe

But

- Labour intensive
- Hyponatraemia
- Banned Hartmann's
- Banned peri-operative Biguanides

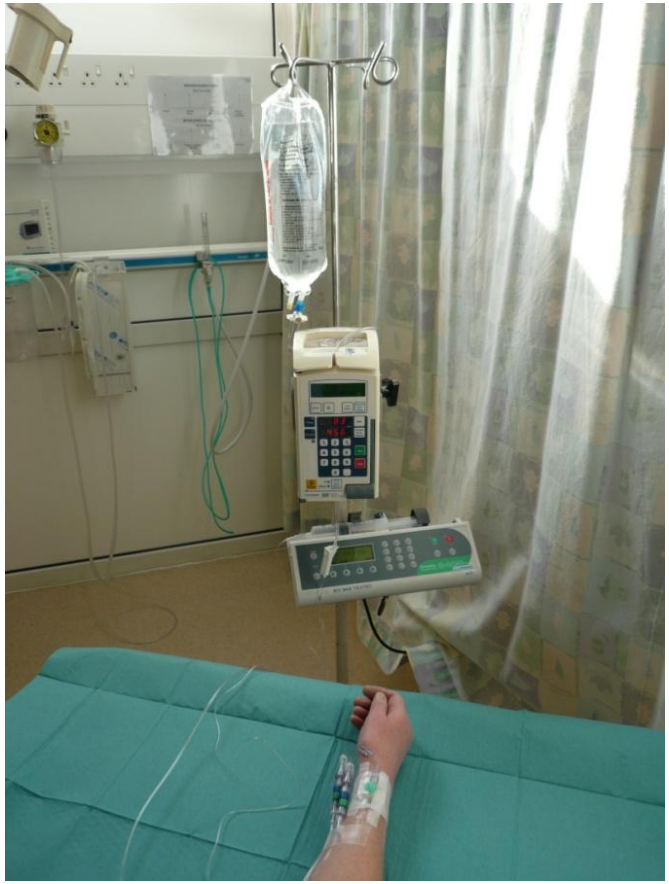
Alberti K et al. BJA 1979

The Sliding scale



Eldridge et al. *Anaesthesia* 1996

Problems with sliding scales reported to the NPSA



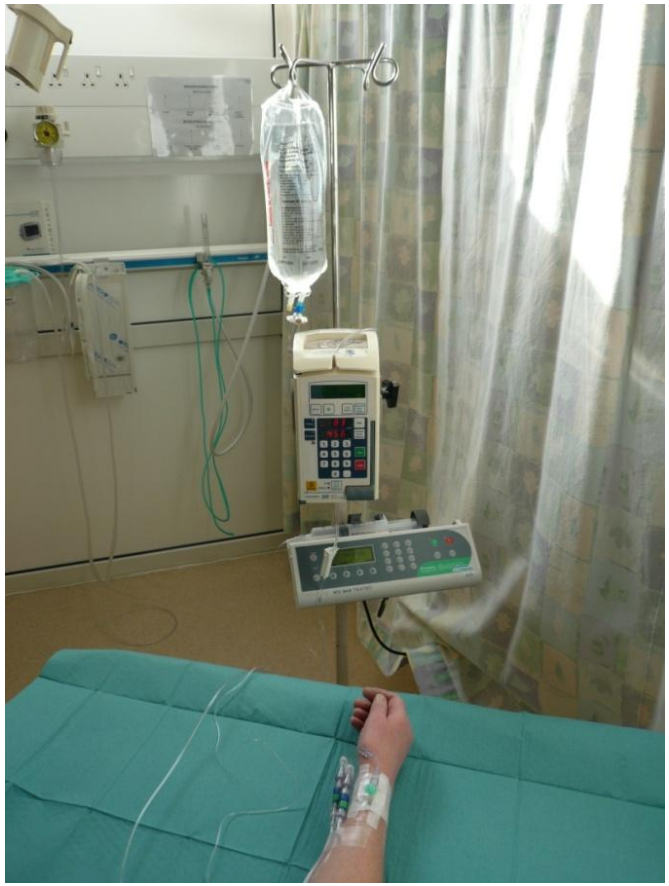
- Multiple critical incidents
  - Wrong programming
  - Wrong configuration
  - Pumps removed for transfers
  - Poor timing of establishment and discontinuation
  - Hyponatraemia

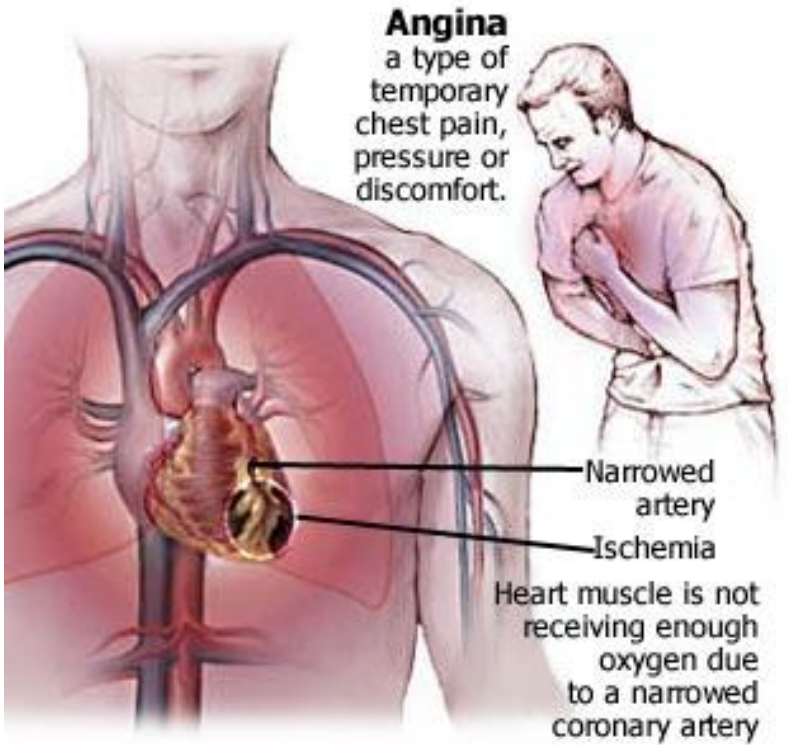
Patient Experience 1

- *“I was hooked up to a machine to regulate my blood glucose… the nurses didn’t seem to have a clue about how the machine worked… Both me and my family were left feeling very angry about the experience."*

Diabetes UK. Collation of inpatient experiences. 2007

Why are surgical patients with diabetes denied day surgery?





Not Fit for Day Surgery??

Sir Steve Redgrave

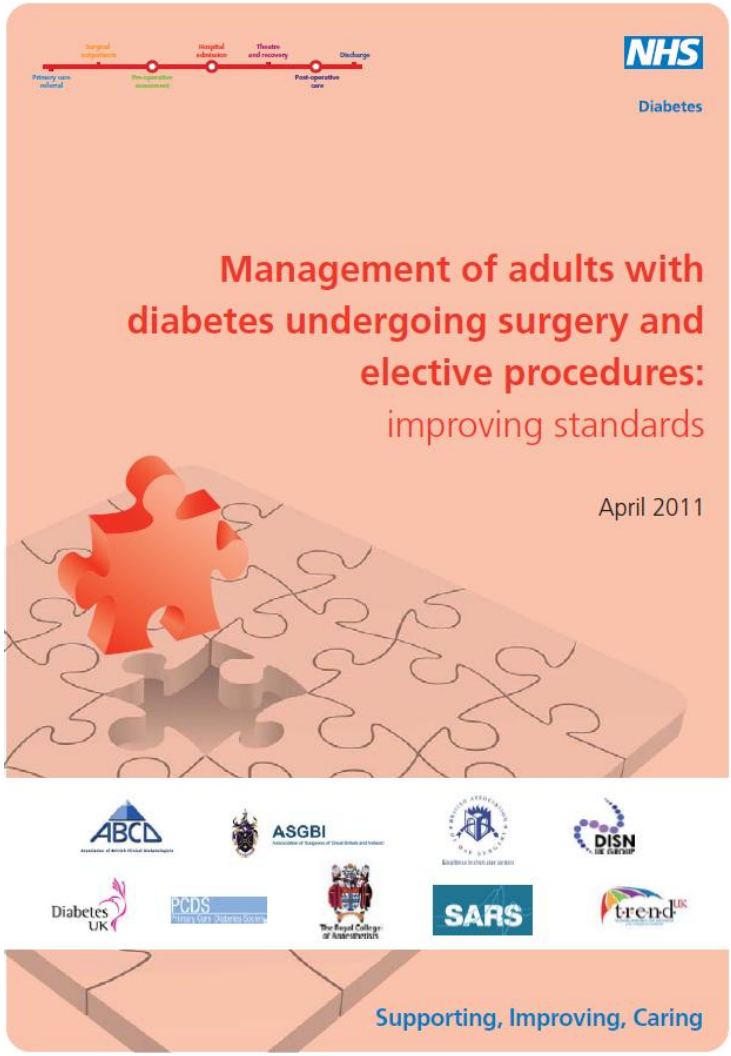
Sharon Stone

Rational for new Paradigm of care

- Diabetes is a major risk factor (*?modifiable)*
- Some dogmas of care may be deleterious
- Sliding scales can be dangerous
- Medical and nursing staff often do not understand diabetes
- Expert Patients
- Day surgery under-utilised

Aims of the guidelines

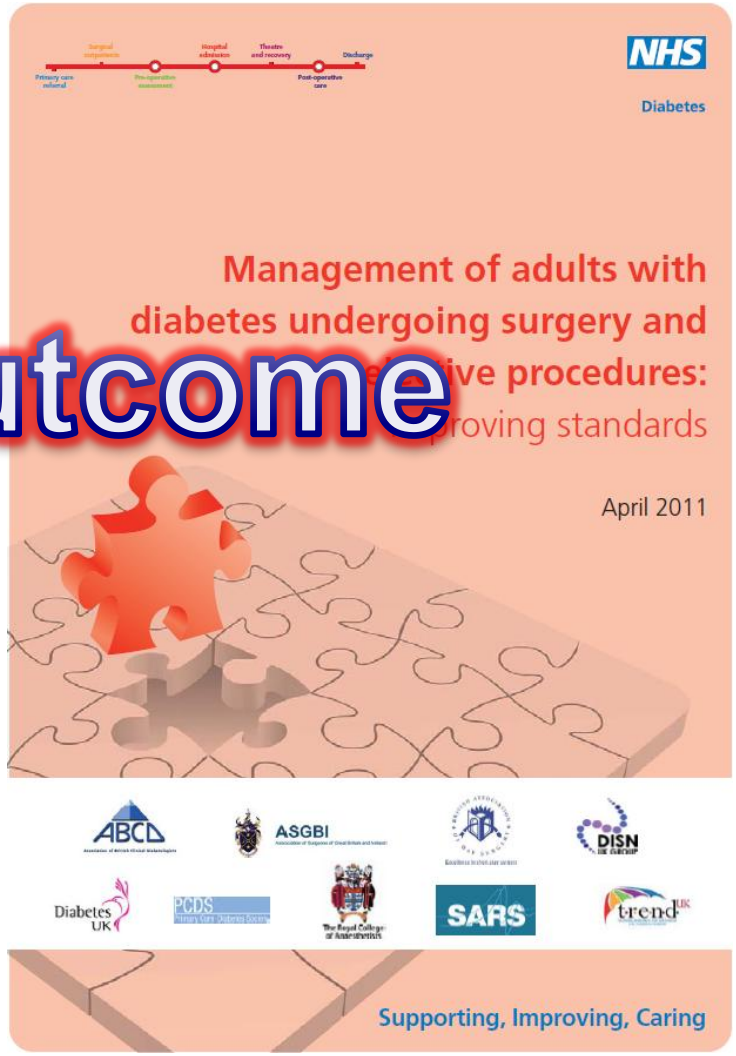
- Reduce Complications
- Improve Knowledge
- Reduce insulin related harm
- Reduce excess LOS
- Increase patient involvement in care

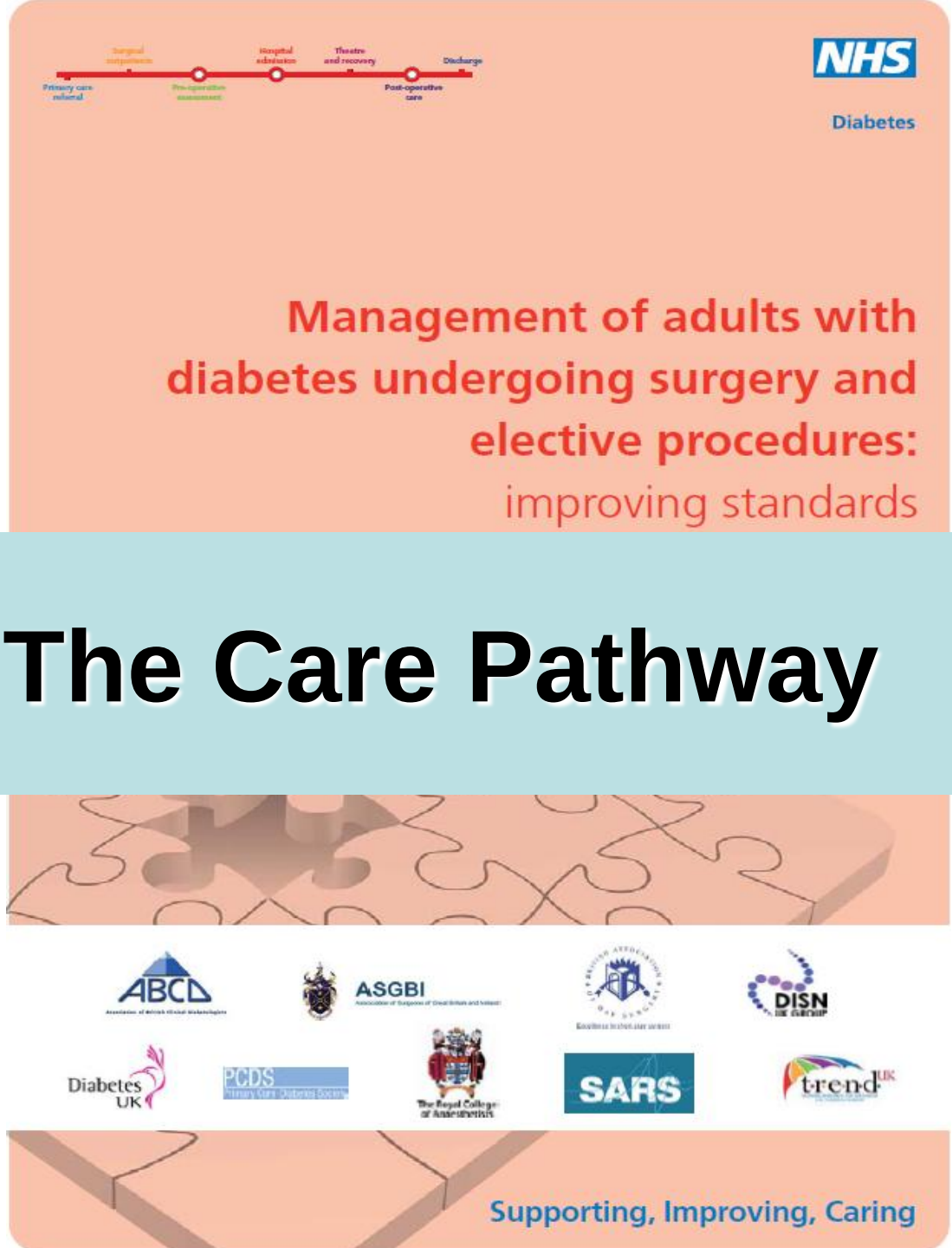


Aims of the guidelines

- Reduce Complications
- Improve Knowledge
- Reduce insulin related harm
- Reduce excess LOS
- Increase patient involvement in care

Improve Outcome





The Care Pathway

Enhanced Recovery

You're better sooner...

NHS
Enhanced Recovery Partnership

Referral from Primary Care

- Optimising pre operative haemoglobin levels
- Managing pre existing co morbidities e.g. diabetes
- Informed decision making

Pre-Operative

- Optimised health / medical condition
- Informed decision making
- Pre operative health & risk assessment
- PT information and expectation managed
- DX planning (EDD)
- Pre-operative therapy instruction as appropriate

Admission

- Admission on day
- Optimised Fluid Hydration
- CHO Loading
- Reduced starvation
- No / reduced oral bowel preparation (bowel surgery)

Intra-Operative

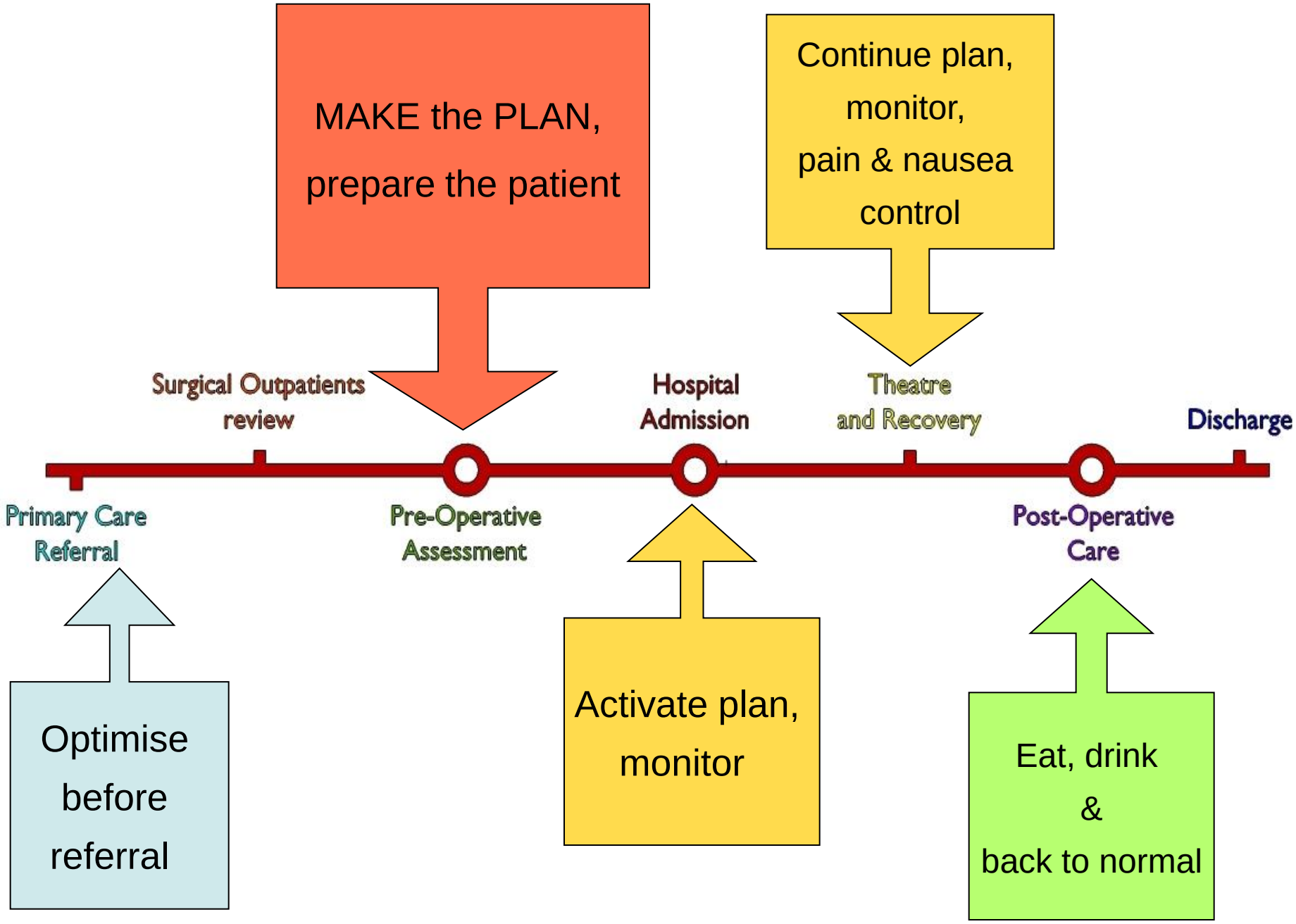
- Minimally invasive surgery
- Use of transverse incisions (abdominal)
- No NG tube (bowel surgery)
- Use of regional / LA with sedation
- Epidural management (inc thoracic)
- Optimised fluid management Individualised goal directed fluid therapy

Post-Operative

- Planned mobilisation
- Rapid hydration & nourishment
- Appropriate IV therapy
- No wound drains
- No NG (bowel surgery)
- Catheters removed early
- Regular oral analgesia
- Paracetamol and NSAIDS
- Avoidance of systemic opiate-based analgesia where possible

Follow Up

- DX when criteria met
- Therapy support (stoma, physio)
- 24hr telephone follow up


MAKE the PLAN,
prepare the patient
Continue plan,
monitor,
pain & nausea
control
Surgical Outpatients
review
Hospital
Admission
Theatre
and Recovery
Discharge
Primary Care
Referral
Pre-Operative
Assessment
Post-Operative
Care
Optimise
before
referral
Activate plan,
monitor
Eat, drink
&
back to normal

Plan A- Manipulation of normal diabetes medication

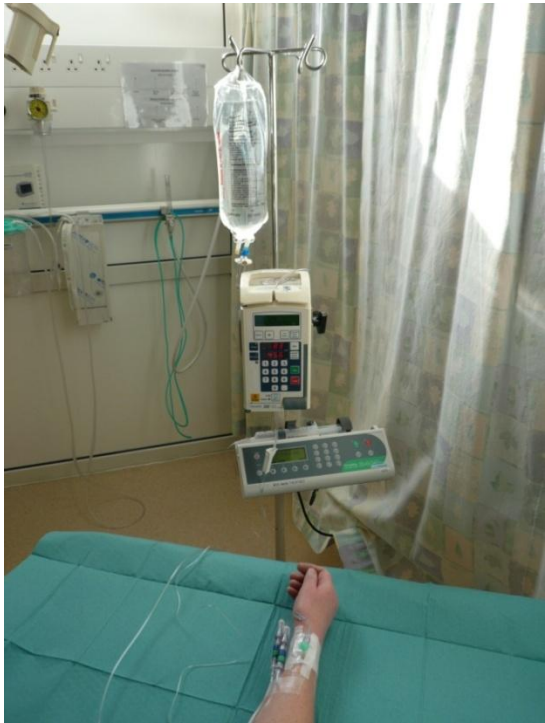
- Short starvation period
- HbA1c well controlled

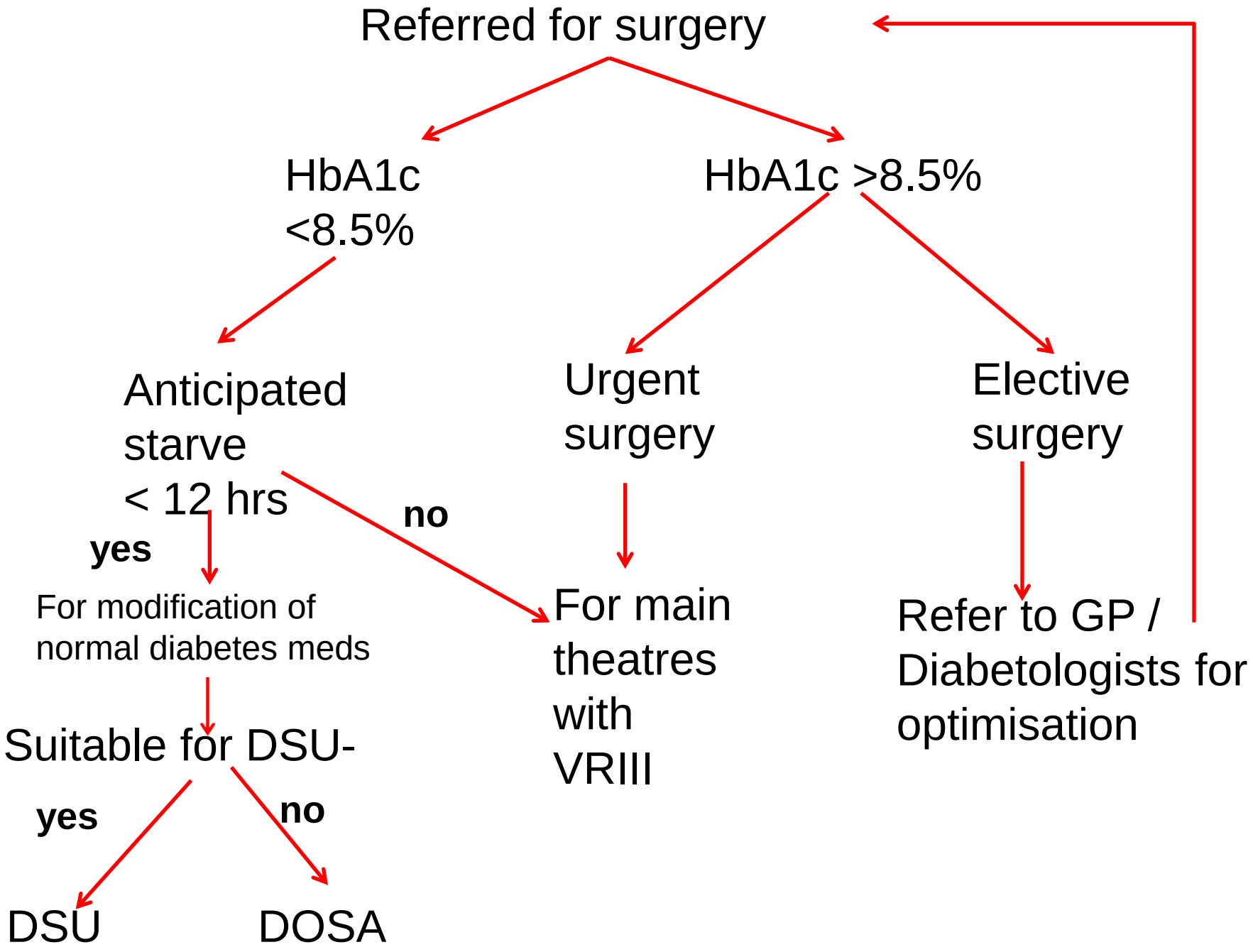
(<69mmol/l or < 8.5%)

- ✓ Day of surgery admission
- ✓ Day of surgery discharge (DSU)
- ✓ no complications assoc with sliding scale
- ✓ Less time for iatrogenic complications

Plan B- Use of Variable Rate Intra-venous Insulin Infusion

- Long starvation period
- HbA1c poorly controlled (>69mmol/l or > 8.5%)
- Emergency surgery




Referred for surgery
HbA1c <8.5%
HbA1c >8.5%
Anticipated starve < 12 hrs
Urgent surgery
Elective surgery
yes
no
For modification of normal diabetes meds
For main theatres with VRIII
Refer to GP / Diabetologists for optimisation
Suitable for DSU-
yes
no
DSU
DOSA

Controversial Topics

1. Pre-Habilitation/ postponing
2. Avoidance of sliding scales
3. How to take a sliding scale down
4. Continue basal Insulin
5. Continue Peri-operative Metformin
6. Role of DSU
7. Choice of fluids
8. WHO checklist and capillary glucose levels
9. Multi-Modal Analgesia with PONV prophylaxis

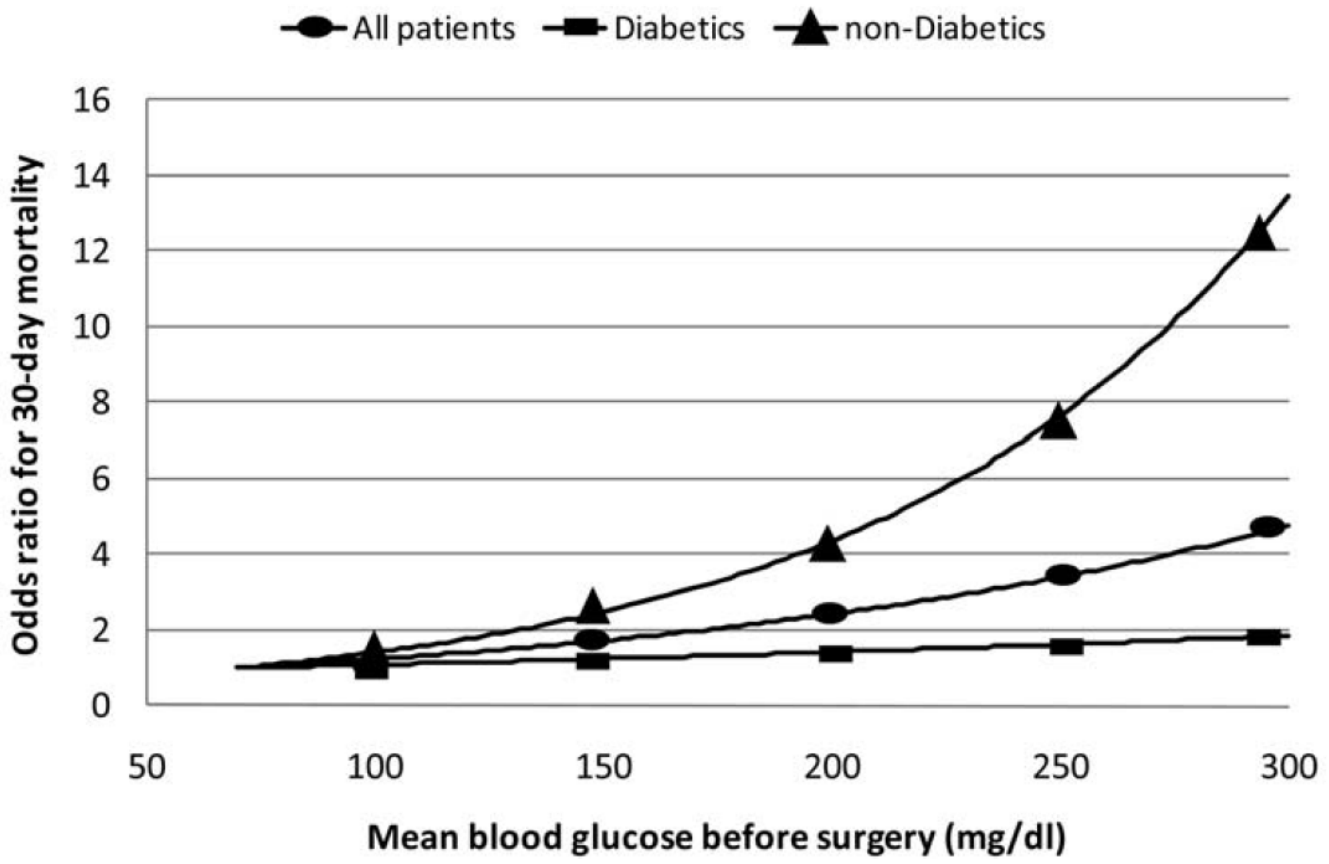
HbA1c as a predictor of complications after major colorectal surgery

	HbA1c > 6·0% (*n* = 31)	HbA1c ≤ 6·0% (*n* = 89)
Respiratory failure	0	1
Plural fluid	1	0
Cardiac failure	0	1
Cardiac arrhythmia	1	2
Postop. bleed	1	4
Postop. ileus	3	1
Anastomotic leak	0	2
Stoma necrosis	1	0
Wound infection	2	7
Pneumonia	3	3
Sepsis	0	1
Urinary infection	3	3
Other infection	1	1
Total no.	16	26
No. of patients with complications	14 (45)	22 (25)
No. of patients with infection	9 (29)	15 (17)

Postoperative complications were more common in patients with a high HbA1c level (odds ratio 2·9 (95% CI 1·1 to 7·9); p=0.037)

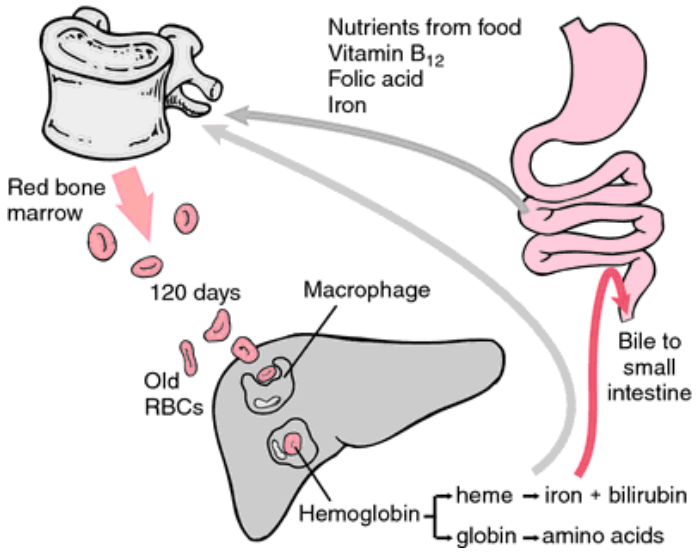
Gustafsson et al. *BJS*. 2009

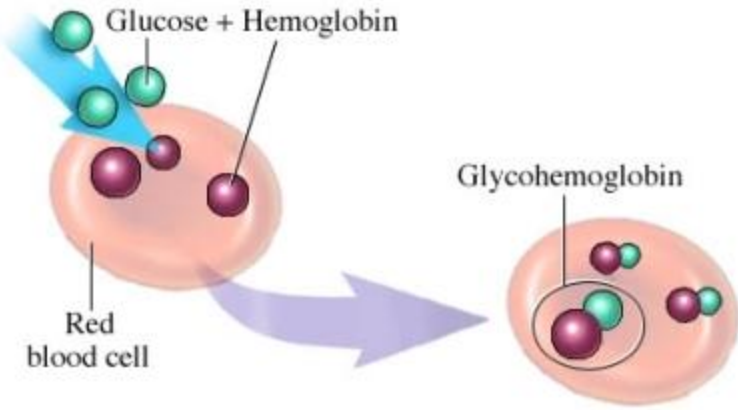
Pre-Op Glucose and Outcome



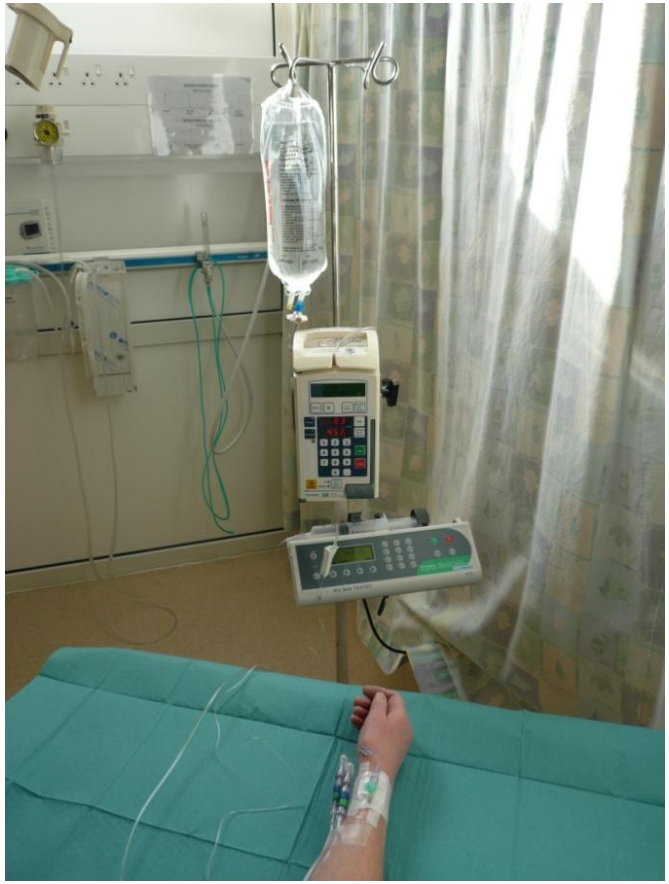
Glycosylated Haemoglobin (Hba1c)

- Normal levels <48mmol/l (6.5%)
- Target is 48-59mmol/l (6.5% to 7.5%)
- Poor control =>59mmol/l (7.5%)
- ? Postpone if >69mmol/l (8.5%)





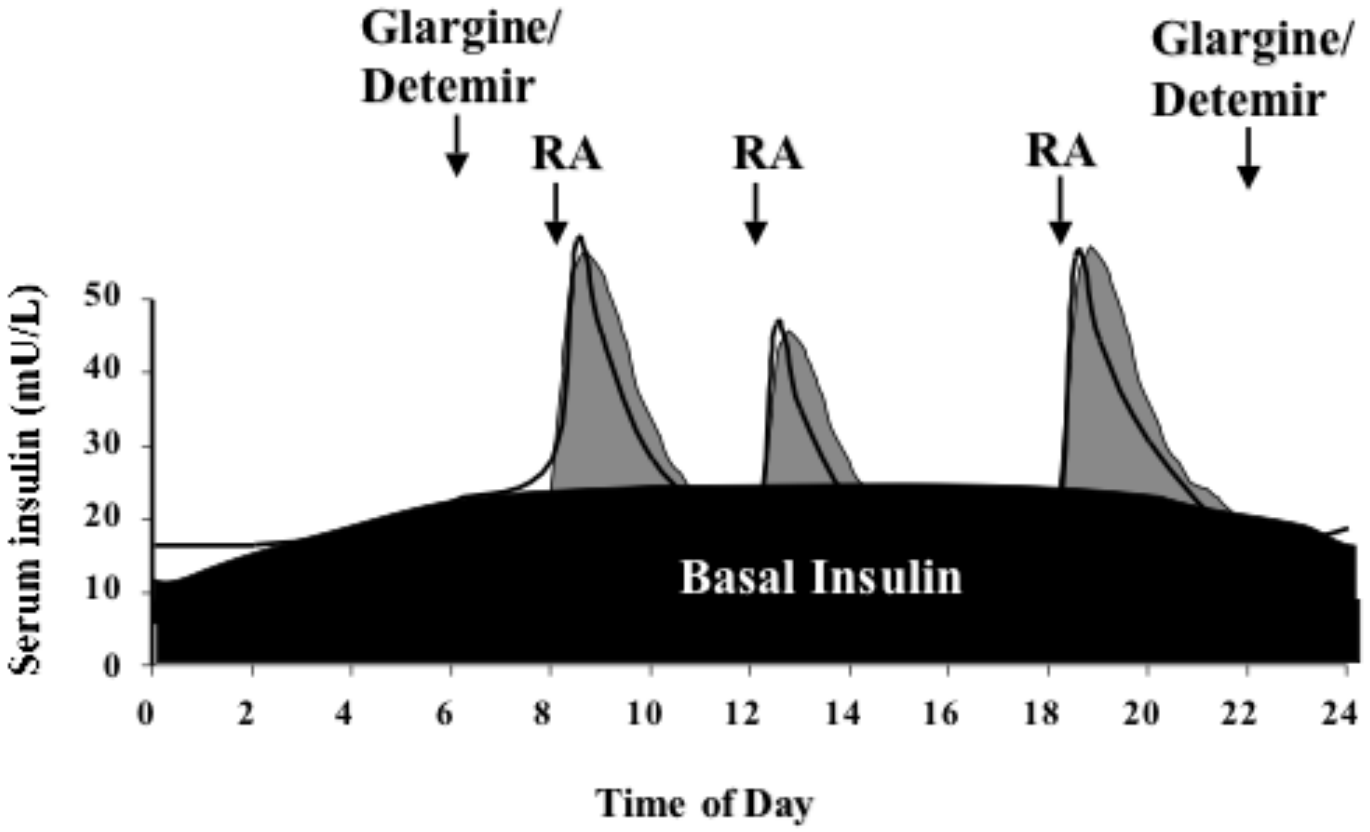
Avoidance of sliding scales



- Multiple critical incidents
  - Wrong programming
  - Wrong configuration
  - Pumps removed for transfers
  - Poor timing of establishment and discontinuation
  - Hyponatraemia

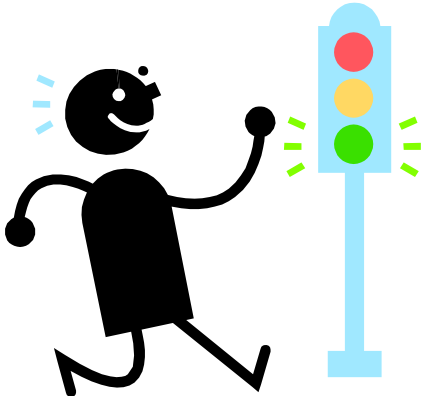
Ensure able to eat and drink and give sc insulin and wait 30 minutes before taking VRIII down

Continuation of Basal Insulin

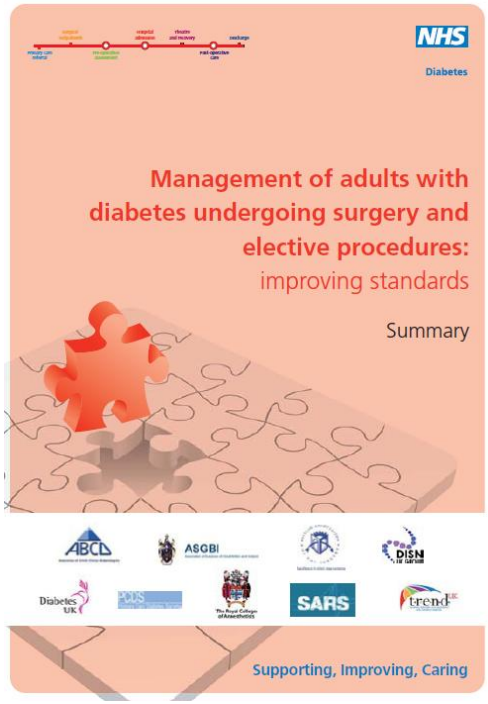


Care with Grazers

Insulins	Day prior to admission	Day of surgery	
		Patient for AM surgery	Patient for PM surgery
Once daily (evening) (e.g. Lantus® or Levemir®. Insulatard®, Humulin I®, Insuman®)	No dose change*	Check blood glucose on admission	Check blood glucose on admission
Once daily (morning) (Lantus® or Levemir® Insulatard®, Humulin I®, Insuman®)	No dose change	No dose change*. Check blood glucose on admission	No dose change*. Check blood glucose on admission



Metformin

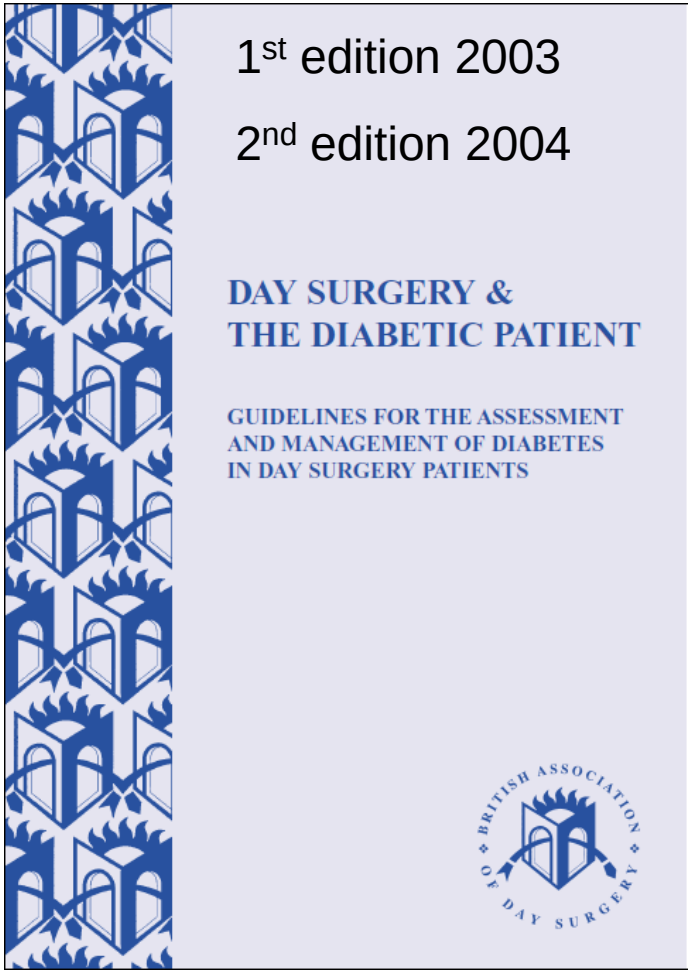


Continue but ensure

- Not tds(reduce to bd)
- No renal impairment
- No dehydration, no prolonged nbm
- No concurrent nephrotoxic agents
  - NSAIDs
  - ACEi / ARBs
  - Radiological contrast

Diabetes and DSU

1999

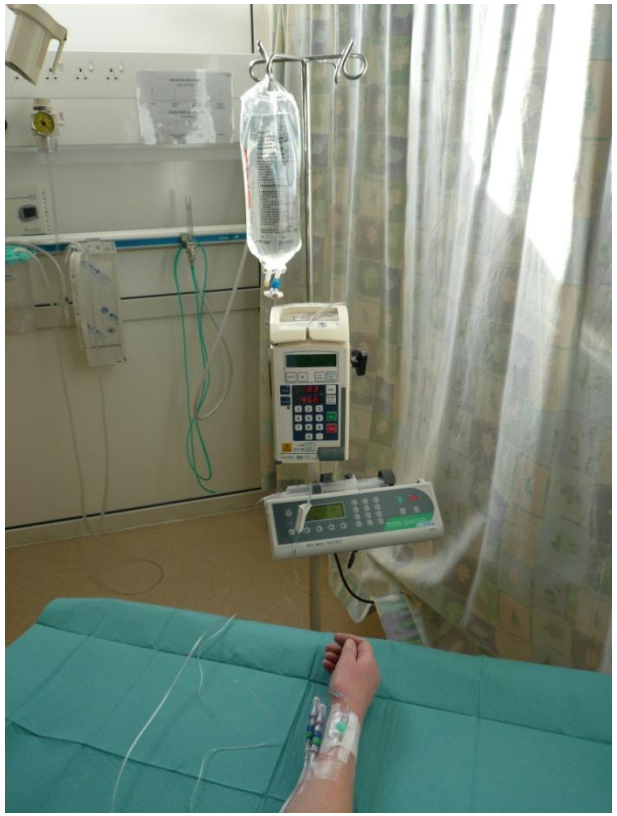


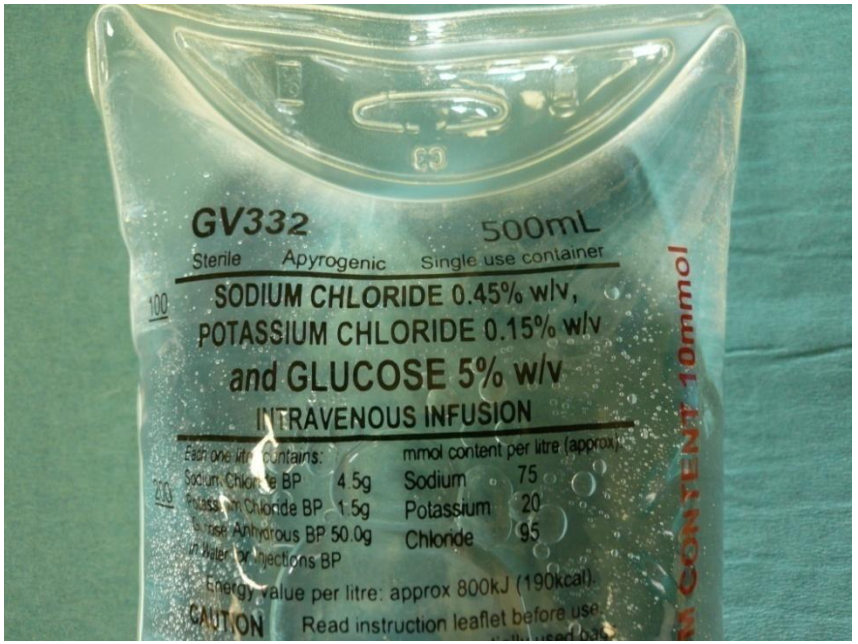
Why is DSU particularly suited for the patient with Diabetes?

1. DSU's philosophy is to get patients eating and drinking ASAP
   - Minimal starvation times
   - Minimal interference with normal diet
2. DSU's philosophy is for Minimal physiological trespass
3. Minimal loss of autonomy
4. Established Pre-op assessment

Choice of Fluids For Surgical Patients with Diabetes

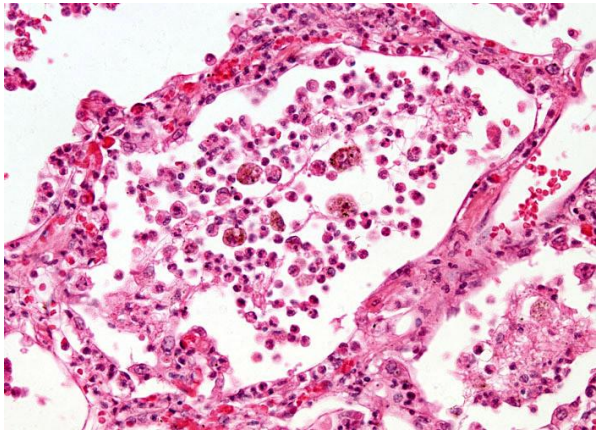
Constant 0.45% saline / 5% glucose / 0.15% KCl with the VRIII

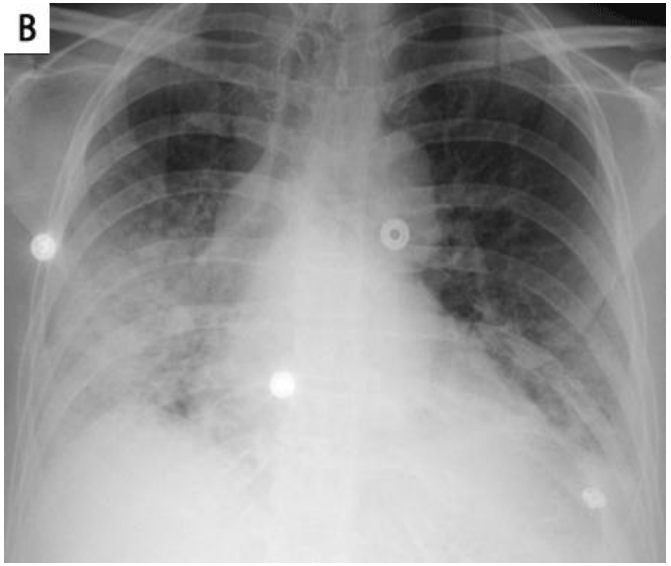


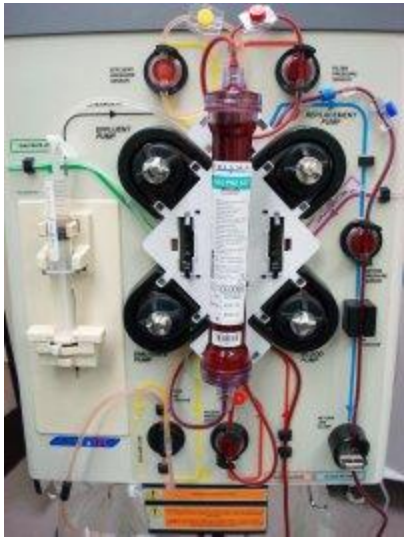


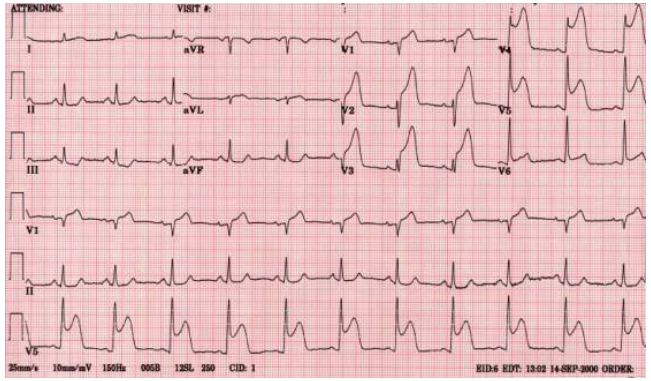
Simpson et al. *Anaesthesia* 2008

Rational for Glycaemic Control









WHO Surgical Safety Checklist

(adapted for England and Wales)

NHS
National Patient Safety Agency
National Reporting and Learning Service

SIGN IN (To be read out loud)

Before induction of anaesthesia

Has the patient confirmed his/her identity, site, procedure and consent?
- ☐ Yes

Is the surgical site marked?
- ☐ Yes/not applicable

Is the anaesthesia machine and medication check complete?
- ☐ Yes

Does the patient have a:

Known allergy?
- ☐ No
- ☐ Yes

Difficult airway/aspiration risk?
- ☐ No
- ☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?
- ☐ No
- ☐ Yes, and adequate IV access/fluids planned

TIME OUT (To be read out loud)

Before start of surgical intervention
for example, skin incision

Have all team members introduced themselves by name and role?
- ☐ Yes

Surgeon, Anaesthetist and Registered Practitioner verbally confirm:
- ☐ What is the patient's name?
- ☐ What procedure, site and position are planned?

Anticipated critical events

Surgeon:
- ☐ How much blood loss is anticipated?
- ☐ Are there any specific equipment requirements or special investigations?
- ☐ Are there any critical or unexpected steps you want the team to know about?

Anaesthetist:
- ☐ Are there any patient specific concerns?
- ☐ What is the patient's ASA grade?
- ☐ What monitoring equipment and other specific levels of support are required, for example blood?

Nurse/ODP:
- ☐ Has the sterility of the instrumentation been confirmed (including indicator results)?
- ☐ Are there any equipment issues or concerns?

Has the surgical site infection (SSI) bundle been undertaken?
- ☐ Yes/not applicable
  - Antibiotic prophylaxis within the last 60 minutes
  - Patient warming
  - Hair removal
  - Glycaemic control

Has VTE prophylaxis been undertaken?
- ☐ Yes/not applicable

Is essential imaging displayed?
- ☐ Yes/not applicable

SIGN OUT (To be read out loud)

Before any member of the team leaves the operating room

Registered Practitioner verbally confirms with the team:
- ☐ Has the name of the procedure been recorded?
- ☐ Has it been confirmed that instruments, swabs and sharps counts are complete (or not applicable)?
- ☐ Have the specimens been labelled (including patient name)?
- ☐ Have any equipment problems been identified that need to be addressed?

Surgeon, Anaesthetist and Registered Practitioner:
- ☐ What are the key concerns for recovery and management of this patient?

PATIENT DETAILS

Last name:

First name:

Date of birth:

NHS Number:*

Procedure:

*If the NHS Number is not immediately available, a temporary number should be used until it is.

This checklist contains the core content for England and Wales

www.npsa.nhs.uk/nrls

Peri-Operative Capillary Blood Glucose target

- **6-10mmol/L**
- **4-12mmol/L acceptable**

Optimal use of Multi-modal Analgesia and use of appropriate prophylactic anti-emetics

Provide multi-modal analgesia with appropriate anti-emetics

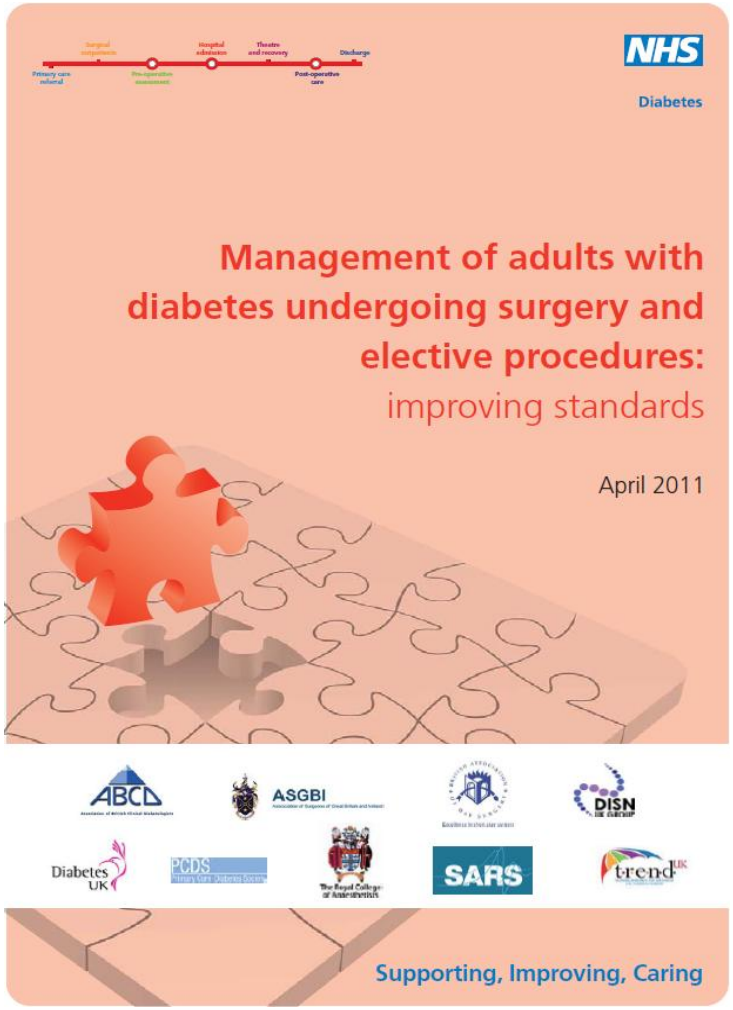

FRANKLIN
MARSHALL

Summary

1. Implications of Diabetes for the NHS and the patient
2. Rational for the guidelines
3. The Care Pathway
4. Controversial Topics

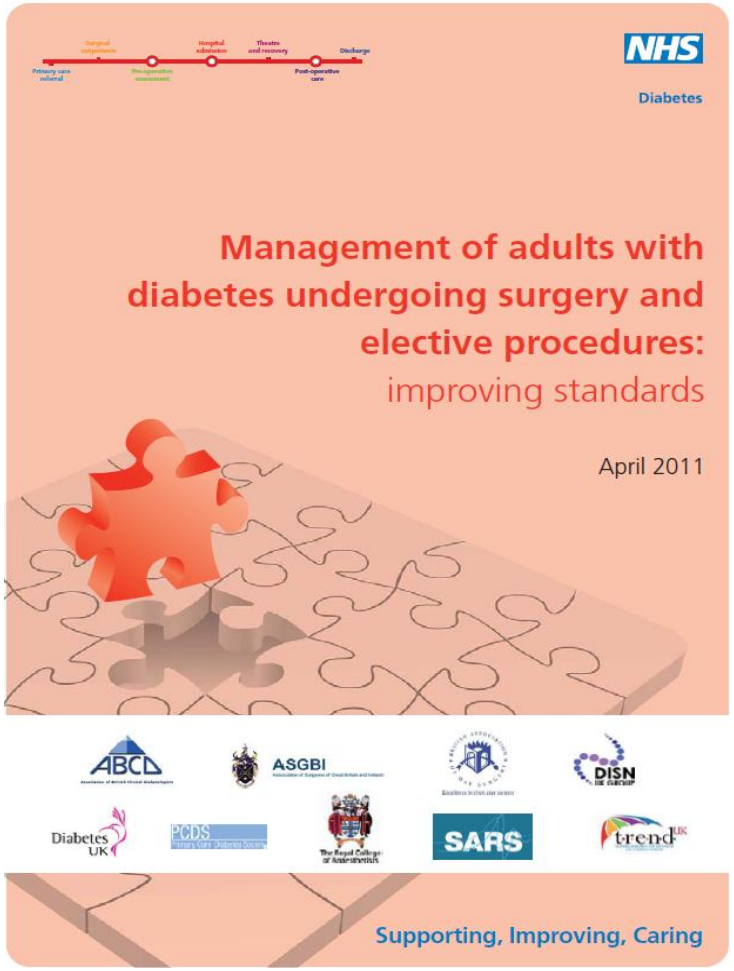
Multi-disciplinary Writing Group

- Anaesthetists
- Diabetologists
- DISNs
- Pharmacists
- Surgeons

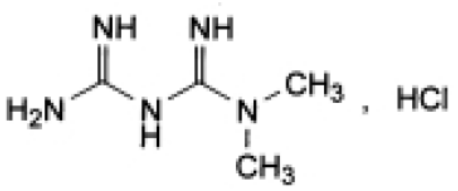


Multi-disciplinary Endorsement

- Association of British Clinical Diabetologists
- Association of Surgeons of Great Britain and Ireland
- British Association of Day surgery
- DISN UK
- Diabetes UK
- Primary care Diabetes Society
- The Royal College of Anaesthetists
- SARS
- Trend



Metformin



- No risk of hypoglcaemia
- Reduces gluconeogenesis
- Increased insulin sensitivity

- Alberti banned biguanides
- Risk of renal failure
- Risk of lactic acidosis

Why Stop Metformin?

Metformin must be discontinued 48 hours before elective surgery. Therapy may be restarted no earlier than 48 hours following surgery or resumption of oral nutrition and only if normal renal function has been established.

SPC metformin. Merck Serono 2010

Suspend metformin on the morning of surgery and restart when renal function returns to baseline

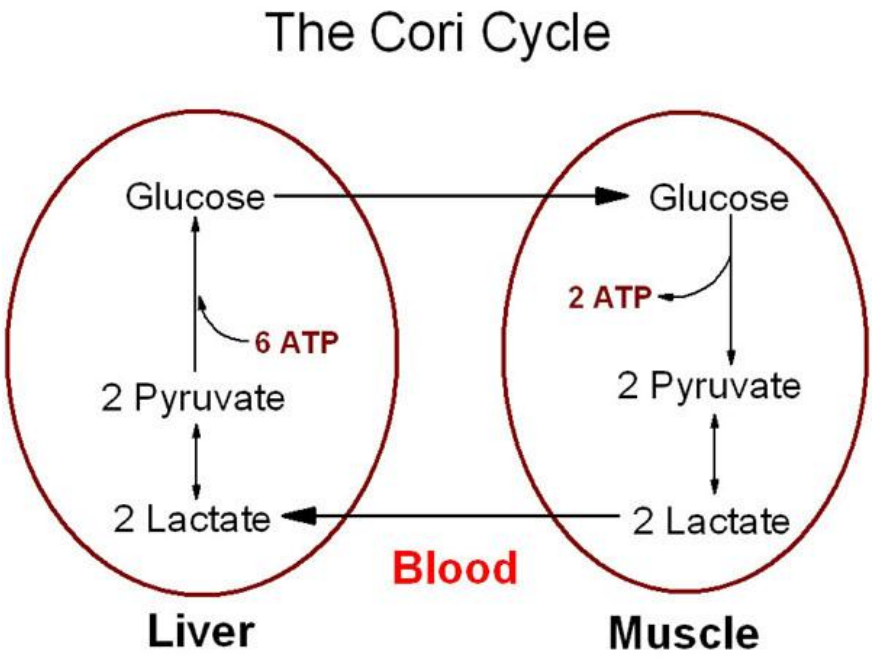
British National Formulary March 2011

Metformin Does Not Increase Morbidity or Mortality After Cardiac Surgery

Factor	Metformin treated	Other oral hypoglycaemic agents	p value
Hospital Mortality	0.7%	1.4%	0.51
Renal Complications	0.5%	1.4%	0.18
Cardiac complications	0.5%	1.4%	0.29
Length of Intubation (median time)	8.1 hours	8.8 hours	0.047
Infection rate	0.7%	3.2%	0.007
Overall Morbidity	3.4%	7.7%	0.005

Duncan et al. *Anaesthesia and Analgesia*. 2007

Hartmann's is not Contra-Indicated in Patients with Diabetes



Thomas & Alberti . BJA 1978

Simpson, Levy, Hall. *Anaesthesia* 2008

Rational for new Paradigm of care

- Diabetes is a major risk factor (*?modifiable)*
- Some dogmas of care may be deleterious
- Sliding scales can be dangerous
- Medical and nursing staff often do not understand diabetes
- Expert Patients
- Day surgery under-utilised