Edwards Critical Care Education

Perioperative Goal-Directed Therapy Protocol Summary

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Evidence-based, Perioperative Goal-Directed Therapy (PGDT) protocols

Note: This protocol summary is designed to help inform clinicians of key published protocols used to guide hemodynamic monitoring in high-risk surgery. **It is not intended to recommend a specific protocol, but to guide hemodynamic optimization through Perioperative Goal-Directed Therapy protocols that have been shown to reduce the number of peri- and postoperative complications, and improve patient outcomes.**[1-3] These protocols represent individual strategies to help physicians either titrate or tailor fluid therapy in an individual patient or clinical situation. Since every case is different, physicians must weigh the risks and benefits of initiating any specific protocol.

Please refer to Edwards Critical Care Education at Edwards.com/ccEducation for updates and additional information.

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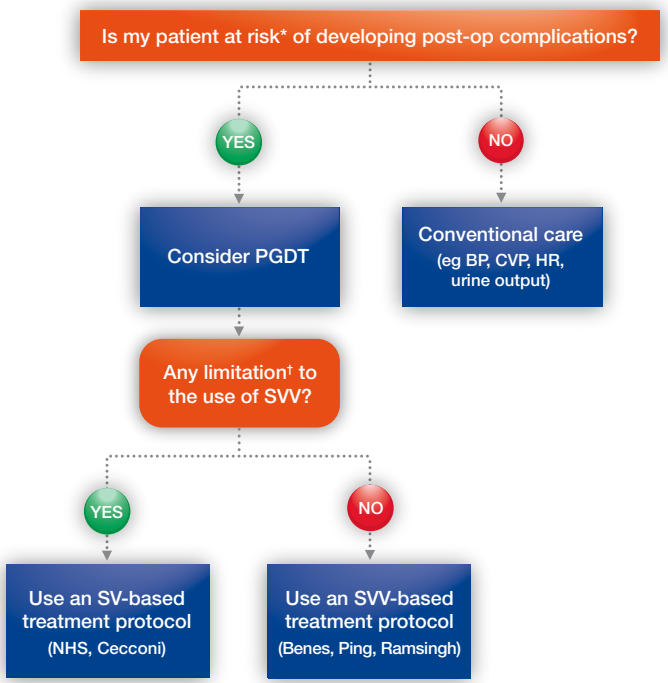
Considering a protocol

The following algorithm is provided to help you select the most appropriate Perioperative Goal-Directed Therapy (PGDT) protocol for your patient. Your selection deserves careful consideration.



*At risk because of comorbidities or the surgical procedure itself.

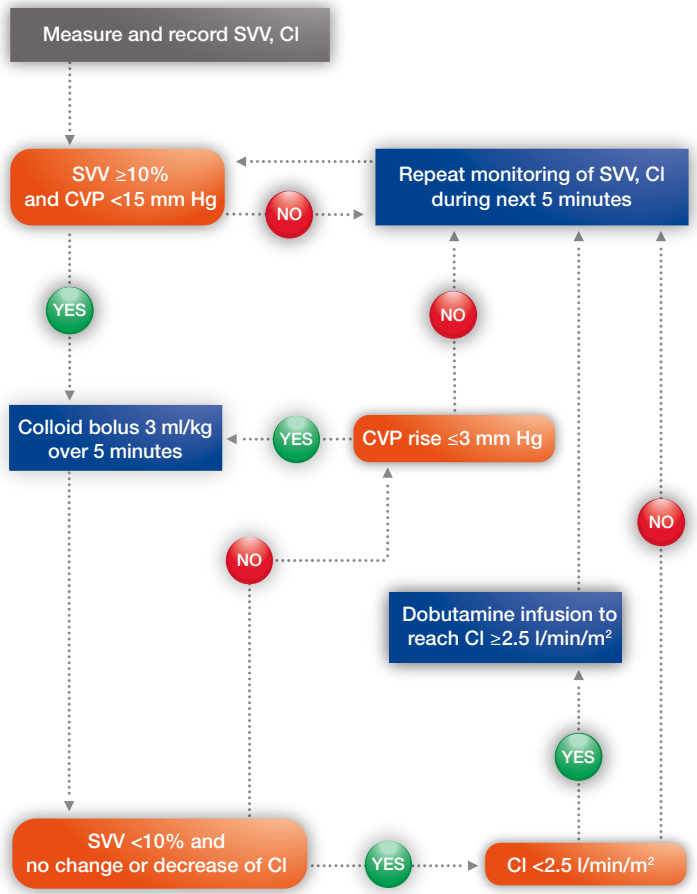
†Limitations to the use of SVV: Spontaneous breathing, tidal volume <7 ml/kg, open chest, atrial fibrillation, right ventricular failure, and laproscopic surgery.

Abbreviations: BP: Blood Pressure; **CVP:** Central Venous Pressure; **HR:** Heart Rate; **SV:** Stroke Volume; **SVV:** Stroke Volume Variation.

Benes Protocol[1]

OVERVIEW

Study Design	Randomized controlled trial
Patient Population	Undergoing elective abdominal surgery >2 h with expected blood loss >1000 ml
Inclusion Criteria	One or more of the following: Ischemic heart disease or severe heart dysfunction, moderate to severe chronic obstructive pulmonary disease, aged 70+, ASA III or more
Target Parameters	Central Venous Pressure, Stroke Volume Variation, Cardiac Index
Intervention	Fluid (Colloid), Dobutamine
Primary Outcomes	Decrease in 30-day postoperative complications (56%), decrease in hospital length of stay (10%)



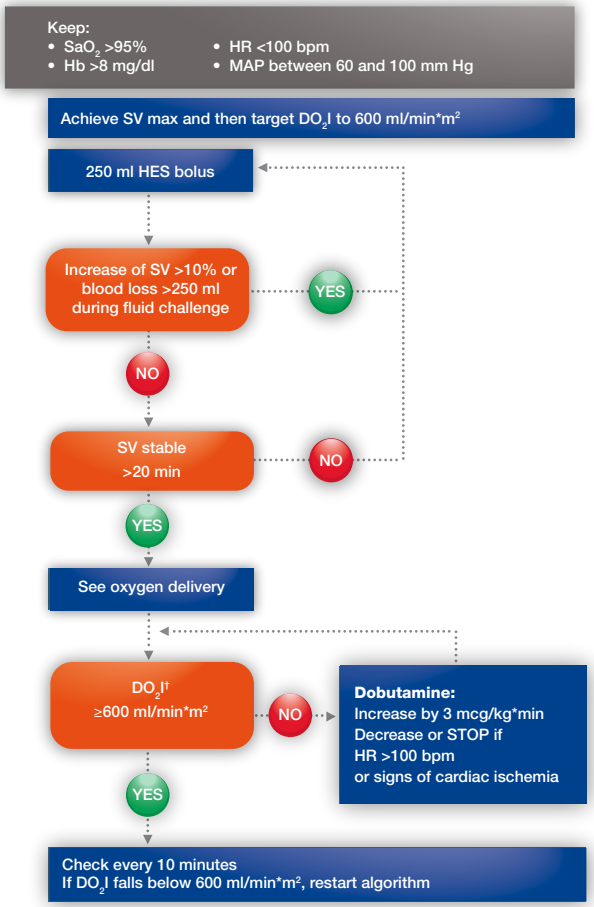
Abbreviations: CI: Cardiac Index; **CVP:** Central Venous Pressure; **SVV:** Stroke Volume Variation.

END PROTOCOL

Cecconi Protocol[2]

OVERVIEW

Study Design	Randomized controlled trial
Patient Population	Undergoing elective total hip replacement under regional anesthesia
Inclusion Criteria	ASA II
Target Parameters	Stroke Volume, Oxygen Delivery
Intervention	Fluid (Colloid), Dobutamine
Primary Outcomes	Decrease in postoperative complications (20%)



†Resuscitation to achieve a DO_2I value of 600 is presented as a goal and not intended to be a hard target. This protocol is intended as guidance, and healthcare professionals should use sound clinical judgment and individualize therapy to each specific patient care situation.

Modified from Cecconi, et al. *Crit Care*. 2011;15:R132.
Based upon Shoemaker[3] protocol.

END PROTOCOL

Abbreviations: DO_2I: Oxygen Delivery Index; **Hb:** Hemoglobin; **HES:** Hydroxyethyl Starch; **HR:** Heart Rate; **MAP:** Mean Arterial Pressure; **SaO_2:** Oxygen Saturation; **SV:** Stroke Volume.

NHS-NICE/Kuper Protocol[4-13]

OVERVIEW

Study Design Quality improvement program (before-after comparison)

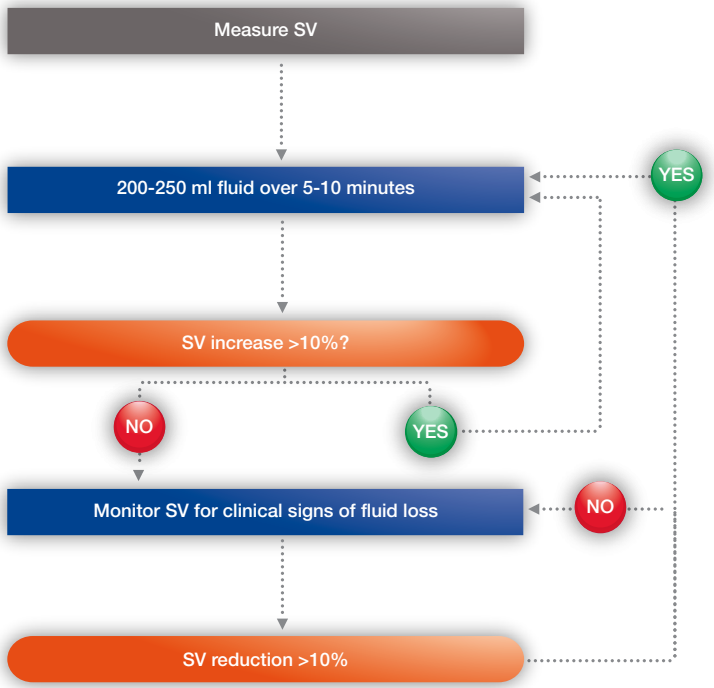
Patient Population Undergoing emergency and elective abdominal, orthopedic, gynecologic, urologic, and vascular surgery

Inclusion Criteria Three cohorts of patients aged ≤60, 61-71, and ≥71 years with ASA >I

Target Parameters Stroke Volume

Intervention Fluid

Primary Outcomes 3.7-day decrease in hospital length of stay (25%)



Abbreviation: SV: Stroke Volume.

END PROTOCOL

Ping Protocol[14]

OVERVIEW

Study Design Randomized controlled trial

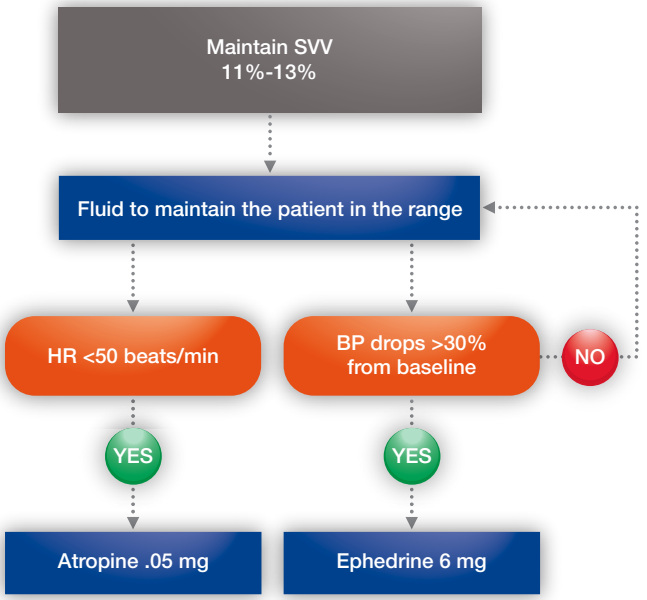
Patient Population Undergoing radical gastrectomy, colon cancer resection, rectal cancer, and Whipple surgery

Inclusion Criteria ASA I or ASA II

Target Parameters Stroke Volume Variation

Intervention Fluid

Primary Outcomes Faster recovery time to normal diet (16%), decrease in hospital length of stay (19%)



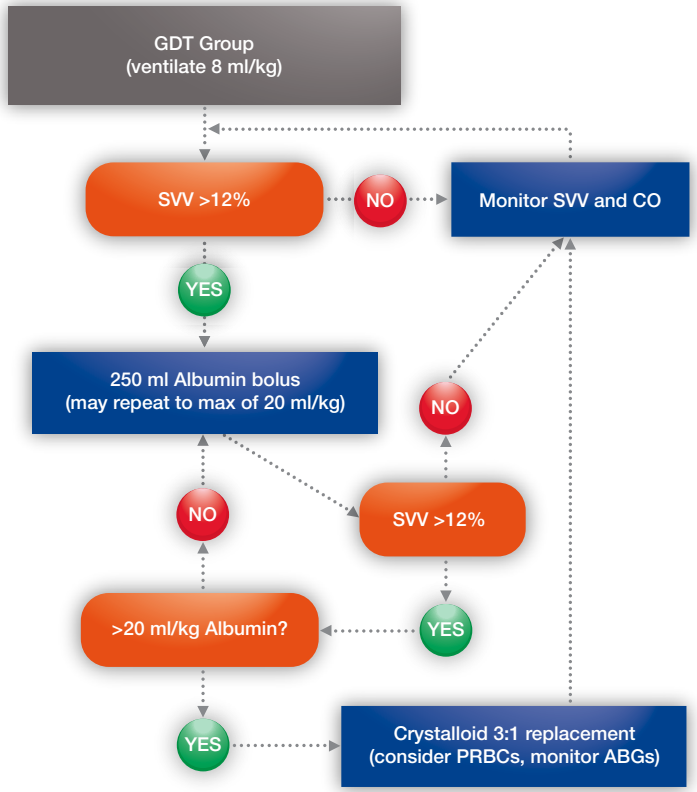
Abbreviations: BP: Blood Pressure; **HR:** Heart Rate; **SVV:** Stroke Volume Variation.

END PROTOCOL

Ramsingh Protocol[15]

OVERVIEW

Study Design	Randomized, single-blinded controlled trial
Patient Population	Undergoing major abdominal surgery, urologic, gastrointestinal or gynecologic cancer resection, and Whipple surgery
Inclusion Criteria	P-POSSUM mean predicted mortality rate of 1.4*
Target Parameters	Stroke Volume Variation
Intervention	Fluid (Colloid)
Primary Outcomes	Faster return of GI function (3 vs 4 days), faster return of PO intake (4 vs 5 days), and a 2.5-day decrease in hospital length of stay (33%)



*No differences other than age were statistically significant. P-POSSUM scores predicted mortality and showed no difference between the groups.

Abbreviations: ABGs: Arterial Blood Gases; **CO:** Cardiac Output; **P-POSSUM:** Portsmouth Physiologic and Operative Severity Score for the Enumeration of Mortality and Morbidity Score; **PRBCs:** Packed Red Blood Cells; **SVV:** Stroke Volume Variation.

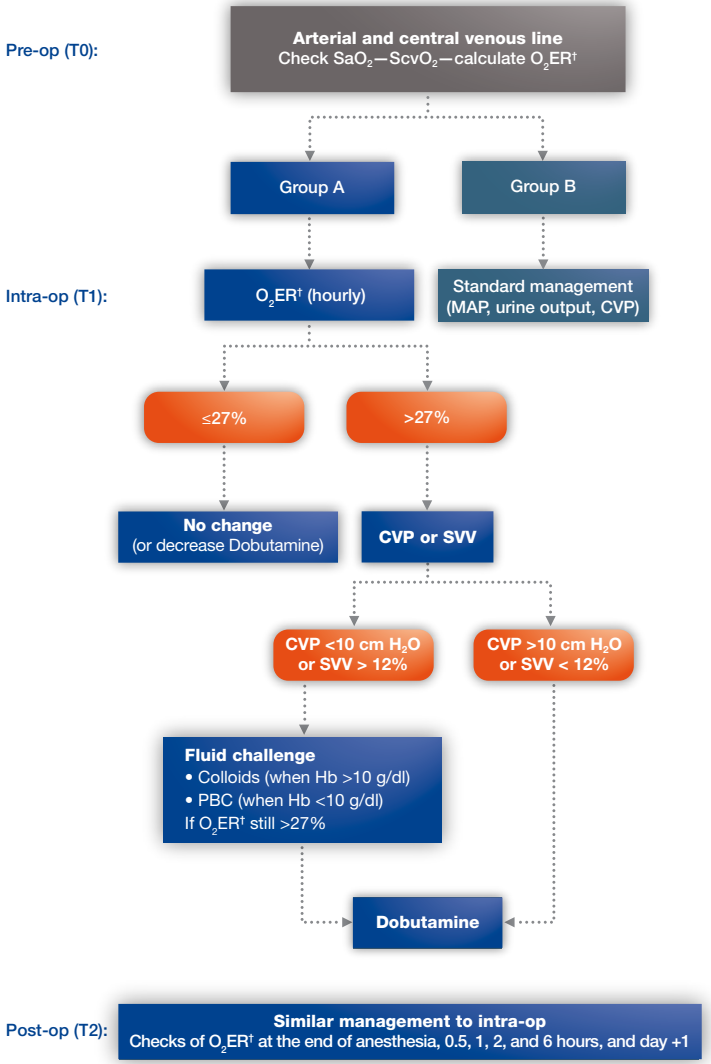
END PROTOCOL

Donati Protocol[16]

OVERVIEW

Study Design	Multicenter randomized controlled trial
Patient Population	Undergoing elective abdominal extensive surgery or abdominal aortic surgery
Inclusion Criteria	ASA II
Target Parameters	Central Venous Pressure, Oxygen Extraction Ratio
Intervention	Fluid (Colloid), Dobutamine
Primary Outcomes	Decrease in postoperative complications (60%), decrease in hospital length of stay (16%)

Abbreviations: CVP: Central Venous Pressure; **Hb:** Hemoglobin; **MAP:** Mean Arterial Pressure; **O_2ER:** Oxygen Extraction Ratio; **SaO_2:** Oxygen Saturation; **$ScvO_2$:** Central Venous Oxygen Saturation.



Modified Donati Protocol: Donati A, et al. *Chest*. 2007;132:1817-1824.
$^{\dagger}O_2ER$ is estimated based on use of $ScvO_2$.

END PROTOCOL

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