

Surgical Expert Systems:

30-Day Mortality

30-day mortality is defined as death within 30 days of hospital admission, and risk factors include advanced age, male sex, and hypertension¹⁻³. As one of the primary outcome measures used to assess and communicate risk, international guidelines recommend using mortality as a quality criterion for gastrointestinal (GI) procedures¹.

*30-day mortality is the **rarest and most feared adverse event following an operation**¹.*

30-Day Mortality risk scores provided by Stream Care™ are selected based on a thorough and extensive review of existing literature, incorporating:

- ✓ 39 Peer Reviewed Papers
- ✓ 2 Systematic Reviews
- ✓ 1 Textbook



Impact

Incidence of 30-day mortality in General and GI procedures sits at 0.79–5.7%⁴. In colorectal surgical populations, 30-day mortality occurs in 2.5–8.5% of cases^{5,6}. Similarly, incidence in esophageal patients ranges from 2.9%–8.4%^{7,8}, while for bariatric operations, 1.3–0.3% of patients experience 30-day mortality^{9,10}.

With clinicians frequently relying solely on their clinical judgement for risk prediction, objective measures in the form of surgical risk tools help inform clinical decision-making and make effective use of hospital resources¹¹. Once a patient has been identified as high risk, mitigation strategies such as pre-emptive admission to critical care or enhanced postoperative surveillance may prevent adverse outcomes¹¹. Critical care is a finite resource, with competition for beds between surgical and emergency medical admissions. To that end, the requirement for a postoperative critical care bed is itself a risk factor for last-minute cancellation, with consequent potential for disruption and harm for both patients and healthcare providers¹². Thus, there is a need to accurately stratify patient risk to make the most of limited resources and improve perioperative outcomes¹¹. This is especially true given the scale of demand, since over 300 million operations take place annually worldwide¹³.

30-day mortality risk prediction that guides clinical decision-making and resource allocation.

Static Risk Scores

SAS

The Surgical Apgar Score (SAS) grades a patient's condition and chances of major complications or death following any general or vascular surgical procedures¹⁴.

Source

SAS was developed by [Gawande et al.](#) and validated by [Singh et al.](#) and [Choudhari et al.](#)

Patient Population

SAS was developed using patients who underwent an open colectomy as their primary procedure¹⁴.

Data Set

BWH-NSQIP Database¹⁴

Sample Size

303¹⁴

Inputs

- Lowest Heart Rate
- Lowest MAP
- Estimated Blood Loss

Performance Metrics

Risk Score	Cited By	Reference	Validation Type	AUC	Specificity	Sensitivity	NPV	PPV
SAS	659	Gawande et al.	Internal	0.72	-	-	-	-
		Singh et al.	External	0.71	0.40	0.73	-	-
		Choudhari et al.	External	0.80	-	0.82	-	-

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FluidAI Medical
809 Wellington St N Unit 2,
Kitchener, ON N2H 5L6

info@fluidai.md
www.fluidai.md
+1 (877) 660-6378