

INTERVENTIONS AND COSTS ASSOCIATED WITH SIVA-DEFINED ADVERSE EVENTS DURING PROCEDURAL SEDATION IN FIVE COUNTRIES

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INTRODUCTION

Procedural sedation is common during gastrointestinal procedures to reduce patient discomfort.

- Sedation may increase the risk of cardiorespiratory adverse events (AEs).
- The world SIVA task force has standardized definitions for AEs during sedation.¹
- The cost of these AEs and their impact on healthcare resource use is unknown.

AIM

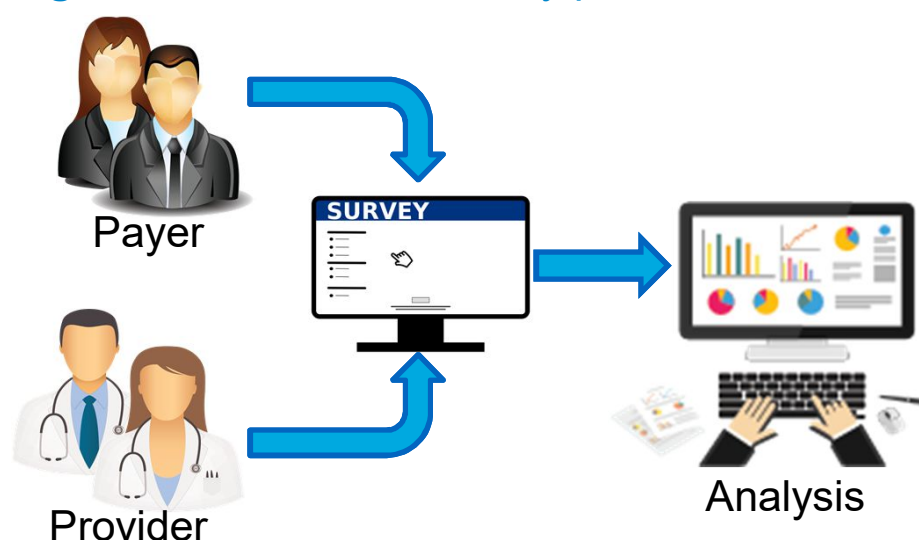
To quantify the cost of SIVA-defined AEs during procedural sedation in France, Germany, Italy, the UK, and the USA.

METHODOLOGY

Online surveys conducted with providers (nurses and physicians) and payers (Figure 1).

- Author-created survey administered online by 3rd party to ensure double-blind process.
- Respondents screened to ensure that they had the expertise to complete the survey.
- Payers provided costs for staff, procedures, and interventions (drugs and devices).
- Providers detailed treatment practices for monitoring, sedatives, and AEs.

Figure 1. Overview of survey process



- For 100 hypothetical patients per AE, providers reported on how many would:
 - Receive each intervention. Interventions, including none, were from SIVA definitions.¹
 - Require an inpatient stay due to the AE.
 - Result in delay or cancellation of procedures.
- Mean AE treatment patterns were calculated.
 - Outliers were identified using Dixon's Q test and replaced by the global mean.
 - Responses from providers more familiar with an AE were given higher weight.
- Mean costs, with outliers removed, were calculated per intervention.
- The sum product of costs and treatment patterns gave the cost per AE (Figure 2).

RESULTS

101 providers and 26 payers were surveyed.

- Payers, 88% hospital based, reported the mean cost of a procedural sedation to be EUR 74 to USD 2,030 (Figure 3).

Figure 2. Direct cost of bradycardia in Germany

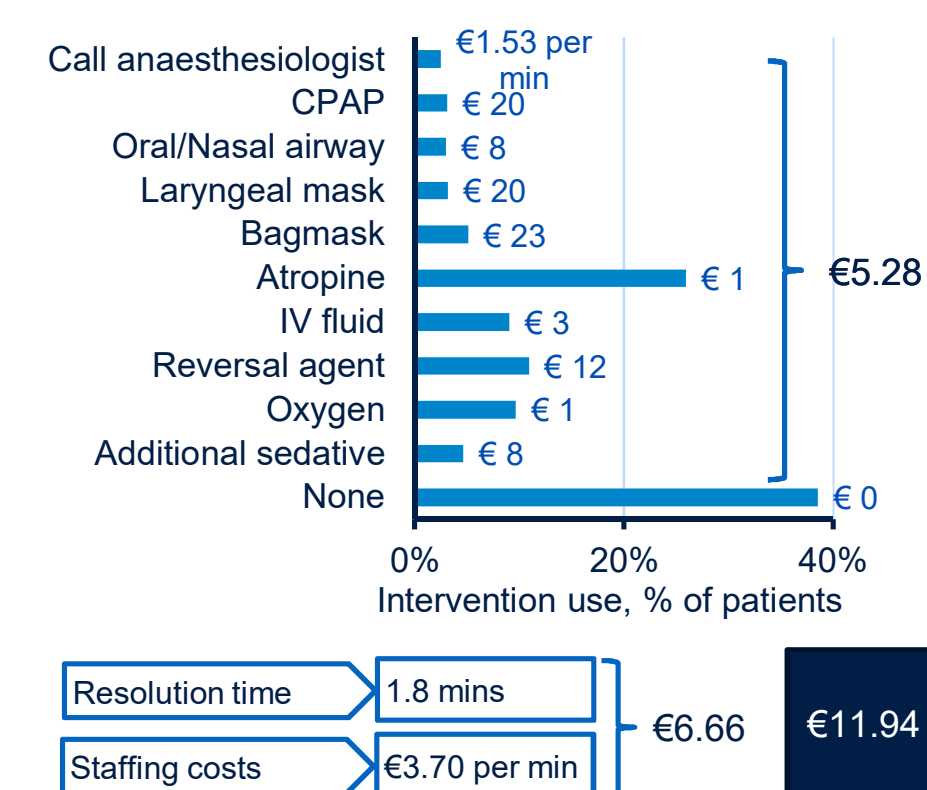
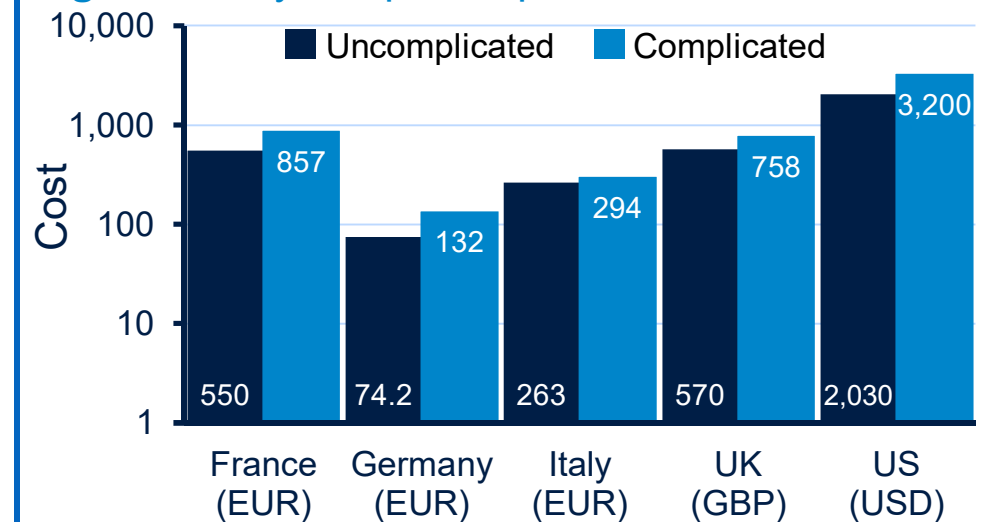


Figure 3. Payer-reported procedural sedation cost



- All SIVA-defined interventions and AEs had a direct cost, which was highest in the USA.
- Over 62% of providers were sedation nurses or gastroenterologists (poster 5311).
- All moderate and sentinel AEs were seen
 - Hypotension and bradycardia were the most frequent AEs observed.
 - Seizure (2.0%) and cardiac arrest (3.0%) were reported by the fewest respondents.
- Common interventions were supplemental oxygen (40% of cases) and none (29%).
- Mean treatment time ranged from 1.7 mins for mild desaturation in Germany to 31.0 mins for cardiac arrest in the USA.
- Intervention and time costs gave the overall mean cost of an AE. See Figure 2, using bradycardia as an example common AE.

Table 1. Mean cost of select adverse events by country. All data are direct cost; fully loaded cost

Country, currency	Hypotension	Mild desaturation	Severe desaturation	Bradycardia	Prolonged apnoea	Cardiac arrest
France, EUR	32; 173	23; 471	79; 1994	17; 131	53; 490	137; 11,936
Germany, EUR	23; 193	18; 212	92; 1268	12; 39	118; 807	274; 4,765
Italy, EUR	41; 111	32; 98	59; 201	33; 93	43; 99	101; 1,195
UK, GBP	69; 537	34; 606	93; 1,258	35; 362	80; 631	658; 8,984
US, USD	247; 841	463; 1,456	529; 1,715	83; 358	394; 1,262	3,877; 19,722

- The mean direct cost ranged from EUR 12 for bradycardia in Germany to USD 3,877 for cardiac arrest in the USA.
- Even minor events led to substantial delay (poster 5311) or procedure termination.
 - This occurred in 3.8% and 4.1% of bradycardia cases in Germany and France, respectively.
- "Fully loaded" costs (including costs for outcomes, delays, and cancellations but not legal costs) were much higher than direct costs (Table 1).
 - The median direct cost over all AEs in EUR countries was EUR 40 (IQR: 29-67).
 - "Fully loaded" this was EUR 301 (IQR: 115-738).

CONCLUSIONS

- Results provide the first estimate of healthcare burden from sedation-related AEs.
- In all countries surveyed, costs of sedation-related AEs were considerable.
- Even AEs often considered minor can disrupt patient flow and provider efficiency.
- Practices to prevent sedation AEs may increase in importance given data presented.