Klinik für Gastroenterologie und Hepatologie

Fortbildungen 2025

Mit freundlicher Unterstützung von:

Gold-Sponsor:

Silber-Sponsor:

Bronze-Sponsor:

USZ Universitäts Spital Zürich

Sedation und Gerinnung

Juliane Hente
Christoph Gubler
22.01.2025

Praktische Anwendung der Propofol-Sedierung

in der Gastroenterologie

Version 6.16

Empfehlung der

Schweizerischen Gesellschaft für Gastroenterologie (SGG)

In Zusammenarbeit mit Vertretern des Vorstandes der Schweizerischen Gesellschaft für Anästhesie und Reanimation (SGAR)

Konsensuspapier der SGAR, SGG, SGK, SSVIR und SGP

Empfehlungen und Standards für die Analgosedierung durch Nicht-Anästhesisten

1. Minirevision April 2018

Prof. Dr. med. Marco Zalunardo, Dr. med. Sebastian Krayer, Dr. med. Thomas Brunner, Prof. Dr. med. Bernhard Walder (SGAR); Prof. Dr. med. Peter Bauerfeind, Dr. med. Stefan Hartmeier, Dr. med. Tobias Ehmann (SGG); Prof. Dr. med. Peter Ammann, Dr. med. Daniel Weilenmann (SGK); Prof. Dr. med. A. Ludwig Jacob (SSVIR); PD Dr. med. Daniel Franzen, Prof. Dr. med. Christophe von Garnier (SGP)

Non-anesthesiologist administration of propofol for gastrointestinal endoscopy: European Society of Gastrointestinal Endoscopy, European Society of Gastroenterology and Endoscopy Nurses and Associates Guideline – Updated June 2015

ESGE ESGENA

Statement 2015: NAAP is safe. Compared with traditional sedation, propofol-based sedation presents similar rates of adverse events, provides better sedation, greater patient cooperation, and higher post-procedural patient satisfaction for most endoscopic procedures; it also decreases time to sedation, decreases recovery and discharge times, and provides higher post-anesthesia recovery scores. For advanced endoscopy procedures, compared with sedation by an anesthesiology provider, NAAP presents similar safety but patient and endoscopist satisfaction are lower (high quality evidence).
Propofol sedation does not seem to be associated with an increase in colonic perforation (low to moderate quality evidence).

Quelle: ESGE Non anesthesiologist administration of propofol for gastrointestinal endoscopy

Sedation – rechtliche Aspekte

Empfehlung der Schweizerischen Gesellschaft für Gastroenterologie (SGG) in Zusammenarbeit mit Vertretern des Vorstandes der Schweizerischen Gesellschaft für Anästhesie und Reanimation (SGAR)

Ärzte:
- Kandidat führt 500 Propofol Sedierungen bei endoskopischen Untersuchungen
- ACLS (danach alle 2 Jahre BLS-AED)
- Basis-Propofolkurs der SGG/SSG (plus alle 3 Jahre Refresher)

Empfehlung Anzahl notwendiger Medizinalpersonen:
- Min. 1 Endoskopiker und 1 Endoskopieassistenz; mind. eine weitere in BLS ausgebildete Medizinalperson muss unmittelbar abrufbar sein
- Hauptaufgabe Assistenzperson: Patientenüberwachung und Medikamentenverabreichung auf Verordnung des Arztes
- Bei Patienten in moderater Sedierung darf Assistenzperson zusätzlich andere kleinere, unterbrechbare Tätigkeiten vornehmen

SGAR SSAR

SGGSSG

Sedation – Vorbereitung

- Richtiger Patient? Indikation gegeben?
- Nüchterner Patient (> 2h klare Flüssigkeit, > 6h Essen)?
- Diabetes mellitus (letztmalige Insulinapplikation)?
- Kardiovaskuläre und respiratorische Erkrankungen? (z.B. instabile KHK, HI, Pneumopathie, OSAS)
- Adipositas Grad II ? (BMI >35 kg/m²)
- Frühere Sedationskomplikationen?
- Antikoagulation/Tc-Aggregationshemmung, Hämophilie?
- Allergien
- Noxen (Alkohol, Nikotin, Drogen)?
- Informed consent: Aufklärung und Einverständnis- erklärung durch urteilsfähigen Patienten

Sedation – Vorbereitung

Statement 2015: We recommend that the type of endoscopic procedure and the patient's American Society of Anesthesiologists (ASA) physical status, age, body mass index, Mallampati's classification, and risk factors for obstructive sleep apnea (OSA) be ascertained before each NAAP procedure (strong recommendation, moderate quality evidence).
We suggest primary involvement of an anesthesiologist in patients of ASA class ≥ 3, with a Mallampati's class ≥ 3 or other conditions that put them at risk of airway obstruction (e. g. pharyngolaryngeal tumors), in patients who chronically receive significant amounts of narcotic analgesics or in cases where a long-lasting procedure is anticipated (weak recommendation, low quality evidence).

Table 2 Pre-procedural risk assessment of possible cardiovascular and respiratory problems during endoscopy.

A detailed history should include information on the following:
1. Diseases of the cardiovascular and respiratory system, stridor, snoring, sleep apnea syndrome
2. Previous complications when sedatives/analgesics, or regional and general anesthesia were administered
3. Drug allergies, current medication, and possible drug interactions
4. Time point and type of food intake
5. Tobacco, alcohol, drug consumption

Dumonceau J-M et al. European Curriculum for Sedation Training in Gastrointestinal Endoscopy… Endoscopy 2013; 45: 496–504

ASA

ASA 1: Keine bekannte Systemerkrankung, keine Medikation, normale Leistungsfähigkeit

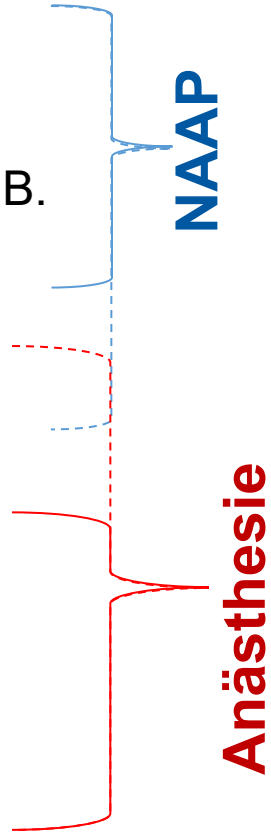
ASA 2: Behandelte und/oder asymptomatische Systemerkrankung, normale Leistungsfähigkeit (z.B. Diabetes, art. Hypertonie, Adipositas)

ASA 3: Stabile Systemerkrankung mit eingeschränkter Leistungsfähigkeit (z.B. St.n. ACS, COPD)

ASA 4: Instabile Systemerkrankung mit starker Leistungseinschränkung, i.d.R. bettlägerig (z.B. schwere Herzinsuffizienz)

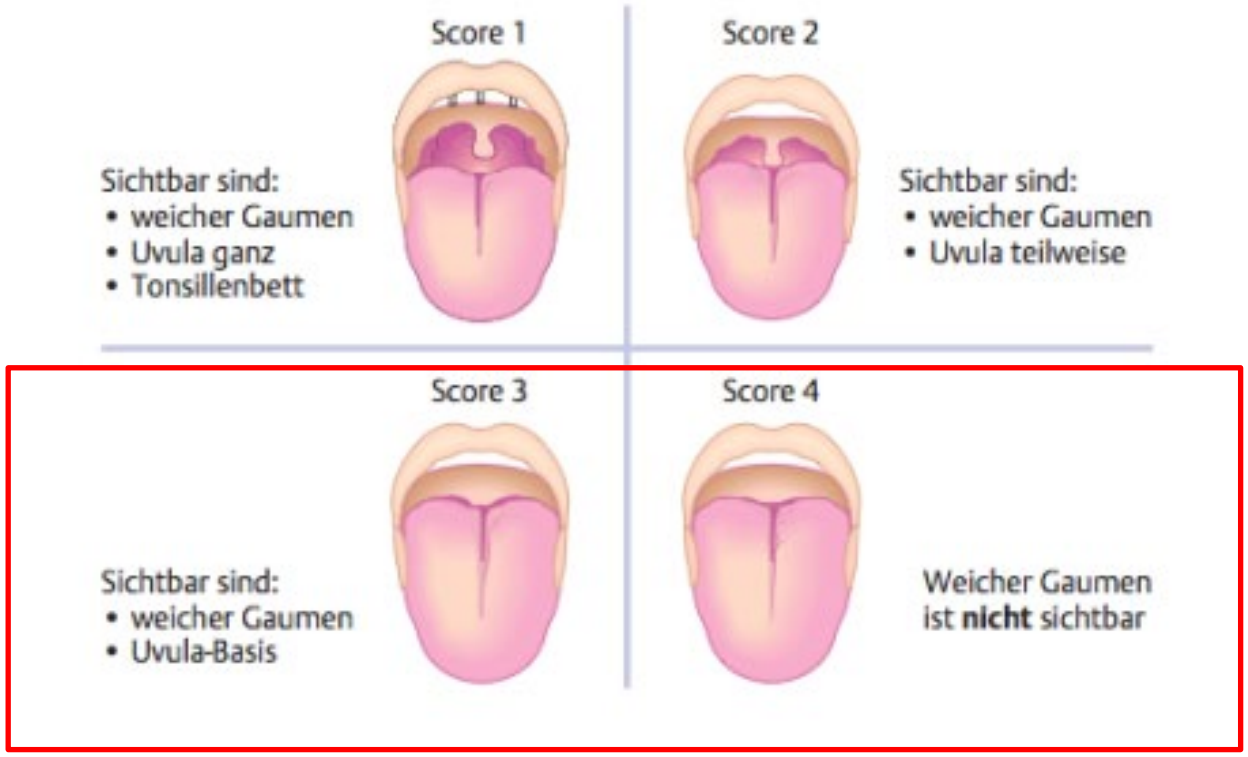
ASA 5: Dekompensierte Systemerkrankung, die längerfristig nicht mit dem Leben vereinbar ist

(ASA 6: Hirntoter Patient, dessen Organe zur Organspende entnommen werden)



American Society of Anesthesiologists. Physical Status Classification System

Mallampati Klassifikation



STOP-Bang Sleep Apnea Questionnaire

STOP

S	So you **snore** loudly (louder enough to be heard through closed doors or louder than talking)?	Yes	No
T	Do you often feel **tired**, fatigued or sleepy during the daytime?	Yes	No
O	Has anyone **observed** you stop breathing or choking or gasping during your sleep?	Yes	No
P	Do you have or are you being treated for high blood **pressure**?	Yes	No

Bang

B	**BMI** more than 35?	Yes	No
a	**Age** – over 50 years old?	Yes	No
n	**Neck** circumference – is it greater than 17" if you are a male or 16" if you are a female?	Yes	No
g	**Gender** – are you a male?	Yes	No

Score your yes tally:

- 0 – 2 Low risk
- 3 – 4 Intermediate risk
- 5 – 8 High risk

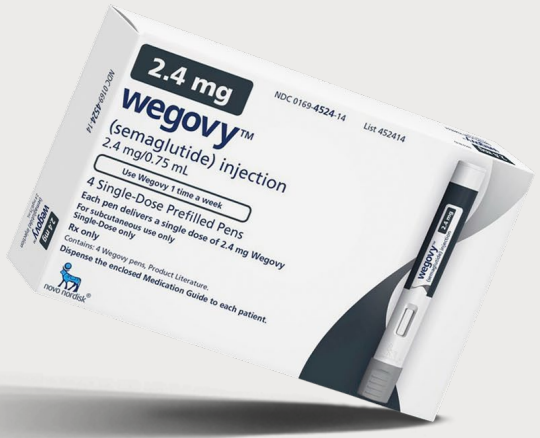
Erhöhtes Sedationsrisiko

1-5% der Patienten haben ein erhöhtes Sedierungsrisiko:

- Unmöglichkeit einer verbalen Kommunikation
- ASA Klasse 3 bei klinisch relevanter kardialer oder pulmonaler Leistungseinschränkung:
  - 2 oder mehr aktive Grunderkrankungen (z.B. COPD und Herzinsuffizienz)
  - Herzinsuffizienz NYHA >2, instabile Angina pectoris, Cor pulmonale
  - Pneumopathie mit Ventilationsstörung
  - Akute pulmonale Erkrankung (Exazerbation, produktive Bronchitis)
- Patienten mit erhöhtem Aspirationsrisiko:
  - erhebliche Adipositas (BMI > 35)
  - funktionelle oder organische Stenosen im oberen Gastrointestinaltrakt
- Patienten mit „schwierigen Atemwegen“:
  - schweres Schlafapnoe-Syndrom
  - anatomische Normabweichungen im Bereich der oberen Atemwege (z.B. eingeschränkte Mundöffnung, eingeschränkte Reklination im HWS-Bereich)
  - einschränkende oropharyngeale Erkrankungen (z.B. Tumor, Laryngektomie)
- instabile neuromuskuläre Erkrankungen (z.B. Hemiparese, ALS)
- nicht eingestellte Epilepsie:
  - bei Anfallsfreiheit unter Medikamenten besteht keine Kontraindikation für Propofolanwendung

Endoskopie unter Spitalbedingungen
(mit Möglichkeit zu Monitored Anesthesia Care)

GLP 1 Analoga – harmlos oder relevant?



ZURÜCK NZZ Abonnieren ANMELDEN

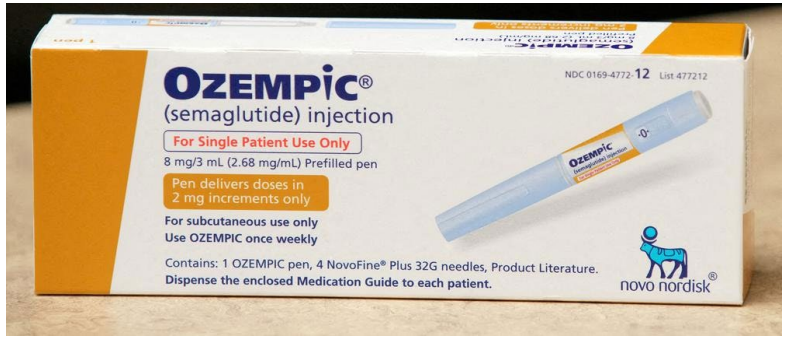
Ressorts anzeigen

Die Hersteller Novo Nordisk und Eli Lilly können die Nachfrage trotz Zukäufen nicht bewältigen

Dominik Feldges

Auf die neumodischen Abnehmspritzen von Novo Nordisk müssen Patienten regelmässig warten.
Jaap Arriens / Imago

Der dänische Pharmakonzern Novo Nordisk ist führend im Geschäft mit den neuartigen Spritzen zum Abnehmen. Doch vor allem sein Medikament Wegovy findet derart reissenden Absatz, dass er mit Produzieren nicht nachkommt. Auch im Schlussquartal 2022 musste er Patienten in



OZEMPIC FixDose 4 mg/3ml (1 mg/Dosis) QAP+
Novo Nordisk Pharma AG

Drucken | DE

- Zusammensetzung
- Darreichungsform und Wirkstoffmenge pro Einheit
- Indikationen/Anwendungsmöglichkeiten
- Dosierung/Anwendung
- Kontraindikationen
- Warnhinweise und Vorsichtsmassnahmen
- Interaktionen
- Schwangerschaft/Stillzeit
- Wirkung auf die Fahrtüchtigkeit und auf das Bedienen von Maschinen
- **Unerwünschte Wirkungen**
- Überdosierung
- Eigenschaften/Wirkungen
- Pharmakokinetik
- Präklinische Daten
- Sonstige Hinweise
- Zulassungsnummer

Erkrankungen des Nervensystems	Häufig	Schwindel
	Gelegentlich	Dysgeusie
Augenerkrankungen	Häufig	Komplikationen der diabetischen Retinopathie[b]
Herzerkrankungen	Gelegentlich	Erhöhte Herzfrequenz
Erkrankungen des Gastrointestinaltrakts	Sehr häufig	Übelkeit Durchfall
	Häufig	Erbrechen Bauchschmerzen Abdominelles Spannungsgefühl Obstipation Dyspepsie Gastritis Gastroösophagealer Reflux Aufstossen Flatulenz
	Gelegentlich	Akute Pankreatitis
Leber- und Gallenerkrankungen	Häufig	Cholelithiasis
	Gelegentlich	Cholezystitis
Erkrankungen der Haut und des	Nicht	Angioedema[c)]

GLP-1-Rezeptro Agonisten

- Stimulieren die Sekretion von Insulin, hemmen Ausschüttung von Glucagon
- Verlangsamt Magenentleerung => erhöht Sättigungsgefühl

In a variety of studies, GLP-1 prolongs the lag time, inhibits propulsion waves, stimulates pyloric tone and doubles time to empty 50% of gastric contents

Smits MM, et al. Gut 2016

ARTICLE IN PRESS

Clinical Gastroenterology and Hepatology 2023;■:■–■

AGA Rapid Clinical Practice Update on the Management of Patients Taking GLP-1 Receptor Agonists Prior to Endoscopy: Communication

Jana G. Hashash,[1] Christopher C. Thompson,[2] and Andrew Y. Wang[3]

[1]Division of Gastroenterology and Hepatology, Mayo Clinic, Jacksonville, Florida; [2]Division of Gastroenterology, Hepatology and Endoscopy, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts; and [3]Division of Gastroenterology and Hepatology, University of Virginia, Charlottesville, Virginia

DESCRIPTION: The purpose of this American Gastroenterological Association (AGA) Institute Rapid Clinical Practice Update (CPU) Communication is to review the available evidence and provide expert advice regarding the evolving management of patients taking GLP-1 receptor agonists prior to endoscopy.

METHODS: This CPU was commissioned and approved by the AGA Institute Clinical Practice Updates Committee (CPUC) and the AGA Governing Board to provide timely guidance on a topic of high clinical importance to the AGA membership and underwent internal peer review by the CPUC and external peer review through standard procedures of Clinical Gastroenterology and Hepatology. This communication incorporates important and recently published studies in this field, and it reflects the experiences of the authors who are experts in bariatric medicine and/or endoscopy.

Keine Evidenz

Empfehlungen

- 8h keine solide Kost 2h keine Flüssigkeiten
- Keine Symptome : Endoskopie

Nausea/Erbrechen/Dyspepsie/Abdominale Distension

-Symptome: => Ultraschall

- Intubation
- 24h flüssige Kost

+ neuer Termin

The American Society of Anesthesiologists (ASA) Task Force on Preoperative Fasting reviewed the available literature on GLP-1 agonists and associated gastrointestinal adverse effects, including the consequences of delayed gastric emptying. The evidence to provide guidance for preoperative management of these drugs to prevent regurgitation and pulmonary aspiration of gastric contents is sparse limited only to several case reports. Nevertheless, given the concerns of GLP-1 agonists-induced delayed gastric emptying and associated high risk of regurgitation and aspiration of gastric contents, the task force suggests the following for elective procedures. For patients requiring urgent or emergent procedures, proceed and treat the patient as 'full stomach' and manage accordingly.

For patients scheduled for elective procedures consider the following:

Day(s) Prior to the Procedure:

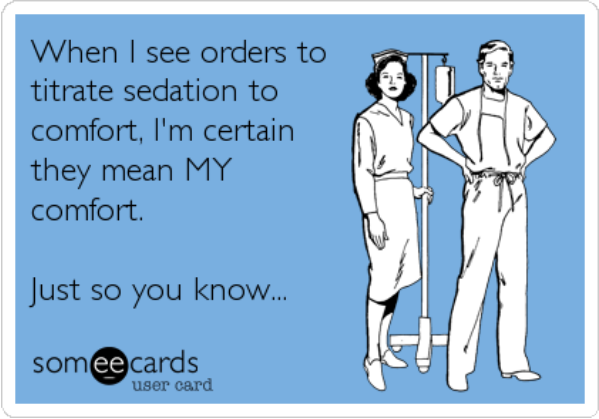
- For patients on daily dosing consider holding GLP-1 agonists on the day of the procedure/surgery. For patients on weekly dosing consider holding GLP-1 agonists a week prior to the procedure/surgery.
- This suggestion is irrespective of the indication (type 2 diabetes mellitus or weight loss), dose, or the type of procedure/surgery.
- If GLP-1 agonists prescribed for diabetes management are held for longer than the dosing schedule, consider consulting an endocrinologist for bridging the antidiabetic therapy to avoid hyperglycemia.

Day of the Procedure:

- If gastrointestinal (GI) symptoms such as severe nausea/vomiting/retching, abdominal bloating, or abdominal pain are present, consider delaying elective procedure, and discuss the concerns of potential risk of regurgitation and pulmonary aspiration of gastric contents with the proceduralist/surgeon and the patient.
- If the patient has no GI symptoms, and the GLP-1 agonists have been held as advised, proceed as usual.
- If the patient has no GI symptoms, but the GLP-1 agonists were not held as advised, proceed with 'full stomach' precautions or consider evaluating gastric volume by ultrasound, if possible and if proficient with the technique. If the stomach is empty, proceed as usual. If the stomach is full or if gastric ultrasound inconclusive or not possible, consider delaying the procedure or treat the patient as 'full stomach' and manage accordingly. Discuss the concerns of potential risk of regurgitation and pulmonary aspiration of gastric contents with the proceduralist/surgeon and the patient.
- There is no evidence to suggest the optimal duration of fasting for patients on GLP-1 agonists. Therefore, until we have adequate evidence, we suggest following the current ASA fasting guidelines.[15,16]

Sedation – Durchführung

Stufe[α]		Bewusstsein	Reaktion auf Stimulation	Spontanatmung	Schutzreflexe	Kreislauf	Intervention
I	**Minimale Sedierung**	Wach	Normale Reaktion auf Anspre-chen	Nicht beeinträchtigt	Nicht beeinträchtigt	Nicht beein-trächtigt	i.d.R. keine
II	**Moderate Sedierung**	Schläfrig (somnolent)	Weckbar, Wachphasen mit normaler Reaktion auf Ansprechen und taktile Stimulation	Ausreichend, adäquat	Nicht beeinträchtigt	i.d.R. nicht beein-trächtigt	i.d.R. keine
III	**Tiefe Sedierung**	Schlafend (soporös)	Nicht weckbar, gezielte Abwehr-bewegungen auf Schmerz-reiz	Mit Beeinträch-tigung ist zu rechnen	Mit Beeinträchti-gung ist zu rechnen	i.d.R. nicht beein-trächtigt	Sicherung der Atemwege/ Beatmung kann nötig werden
IV	**Allgemein-Anästhesie**	Bewusstlos	Keine oder ungezielt	Insuffizient oder fehlend	Aufgehoben	i.d.R. beein-trächtigt	Sicherung der Atemwege nötig



Dumonceau J-M et al. European Curriculum for Sedation Training in Gastrointestinal Endoscopy… Endoscopy 2013; 45: 496–504

Sedation – Durchführung

- Intravenöser Zugang
- Nasale O2-Applikation (2l/min)
- Kontinuierliche Pulsoxymetrie
- Intervall-BD-Messung
- Keine Rachenanästhesie
- Bei komplexen Eingriffen 2. Person

Statement 2010: Patient monitoring is recommended in all patients using continuous pulse oximetry and automated noninvasive blood pressure measurement (at baseline and then at 3 – 5-minute intervals) during both NAAP and the recovery period; continuous electrocardiography is recommended in selected patients with a history of cardiac and/or pulmonary disease. Baseline, minimum and maximum heart rate/blood pressure, as well as baseline and minimum oxygen blood saturation should be recorded. (Evidence level 2++, Recommendation grade B.)

Dumonceau Jean-Marc et al. NAAP: ESGE-ESGENA Guideline 2015 Endoscopy 2015; 47: 1175–1189
SGG: Praktische Anwendung der Propofol-Sedierung in der Gastroenterologie

Pharmakologie Propofol

- Propofol ist ein kurz wirksames Allgemeinanästhetikum, der genaue Wirkungsmechanismus ist nicht bekannt.
- Wirkungseintritt nach 30-45 Sek., Peak nach 1-2 Min., Wirkdauer 4-8 Min.
- Propofol-Gesamtdosis sehr variabel
  - v.a. bei höherem Alter und ASA-Klasse reduziert (>90-Jährige brauchen häufig nur halbe Dosis)
  - Kaum abhängig vom Körpergewicht
- NW: **Hypoventilation, Hypotension**, Bradykardie (v.a. bei Betablockertherapie), lokale Schmerzen (30%), 10% Muskelzuckungen (nicht-epileptische Myoklonien)

Dosierung Propofol

- Priming gemäss “20/2 Regel“: Erste Dosis von 20 mg (= 2 ml 1% Lösung), danach Pause von 2 Minuten zur Öffnung der Bluthirnschranke vor Verabreichung des nächsten Propofol-Bolus.
- danach Bolus-Titration gemäss “20/20 Regel“: maximal 20 mg nicht häufiger als alle 20 Sekunden.
- Untersuchung starten wenn Schutzreflexe noch vorhanden (deshalb auch keine Rachenanästhesie empfohlen)

Kombination von Propofol mit anderen Substanzen

- Grundsätzlich Propofol-Monotherapie empfohlen.
- Kombination z.B. mit 1 mg Midazolam oder 25 mg Pethidin ist möglich.

Propofolsedation- Komplikationen

- Rate schwerer Komplikationen: ca. 0.016% (1)
- Letalität : ca. 0.003% (2)
- Risikofaktoren:
    - ASA ≥ 3
    - Notfallendoskopien
    - Art und Dauer der Untersuchung
    - Alter

NAAP sehr sicher bei ASA 1 und 2
(mit Anästhesie keine erhöhte Patientensicherheit)

Korrekte präinterventionelle Risikobeurteilung entscheidend!

1) Sieg A. Safety analysis of endoscopist-directed propofol sedation: a prospective, national multicenter study, Gastroenterol 2014
2) Frieling T, Sedation associated complications in endoscopy – Gastroenterol 2013

Sedation – Komplikationen

1. STOPP PROPOFOL

Der „Propofol-Antagonist“ ist die Zeit (Wirkungsdauer 4-8 Minuten)

ATEMDEPRESSION

1. Akustische und mechanische Weckreize
   Patienten schütteln und laut auffordern, tief durchzuatmen.
   Patienten in die Haut kneifen, Druck / kräftiges Reiben über dem Manubrium.
2. nasale Sauerstoffzufuhr erhöhen auf 6-10 Liter/Min
3. Freihalten der Atemwege
   Unterkiefer nach vorne ziehen und anheben (sog. Esmarch Griff). Kopf reklinieren
4. Nasopharyngealer Wendl-Tubus
5. Beatmung mit Beutel und Maske, O2 direkt an Beatmungsbeutel anschliessen.

HYPOTONIE/BRADYKARDIE

1. Messfehler? Vagale Schmerzreaktion?
2. Patient stimulieren
3. Bei Hypotonie Infusionsbolus (NaCl 0.9% oder RL)
4. Evtl. Ephedrin 5 – 10 mg iv, alle 5 Minuten
5. Bei Bradykardie: Atropin 0.5 mg iv, alle 5 Minuten

Propofol-Sedation – Schwangerschaft/Stillzeit

Kompendium:

- Es liegen keine klinischen Daten mit Anwendung bei Schwangeren vor. Tierexperimentelle Studien haben eine Reproduktionstoxizität gezeigt.
- Publizierte tierexperimentelle Studien mit Anästhetika/sedierenden Medikamenten berichteten von unerwünschten Wirkungen auf die Gehirnentwicklung im frühen Stadium. Propofol sollte deshalb während einer Schwangerschaft nicht angewendet werden.
- Propofol durchquert die Plazentaschranke und kann eine neonatale Depression verursachen. Propofol sollte daher nicht bei geburtshilflichen Eingriffen eingesetzt werden.
- **Stillzeit:** Studien mit stillenden Frauen haben gezeigt, dass Propofol in geringen Mengen in die Muttermilch übergeht. Mütter sollten daher bis zu 24 Stunden nach der Gabe von Propofol mit dem Stillen aussetzen und die entsprechende Muttermilch verwerfen.

Embryotox:

- Grün = Medikament der Wahl! Erfahrungsumfang: HOCH
- Propofol hat eine lange Markterfahrung und wird zunehmend in der geburtshilflichen Anästhesie verwendet. Ein teratogenes Risiko ist bisher nicht beschrieben und wird auch nicht erwartet, obwohl systematische Studien fehlen. Im Tierversuch wurde keine Erhöhung des Fehlbildungsrisikos gezeigt. Propofol passiert schnell die Plazenta. Die fetalen Blutkonzentrationen entsprechen etwa 70% der mütterlichen Werte. Negative Auswirkungen auf das Neugeborene sind bisher nicht gesehen worden.
- **Stillzeit:** Propofol geht nur in sehr geringen Mengen in die Muttermilch über. Bisher wurden keine Symptome bei gestillten Kindern nach mütterlicher Narkose mit Propofol berichtet. Die Mutter darf stillen, sobald sie nach einer Narkose mit Propofol in der Lage ist, ihr Kind selbstständig anzulegen.

→ Strenge Indikationsstellung in RS mit Geburtshelfern und Anästhesie

Sedation – Propofol Kontraindikationen?

- Guidelines SGG 2014/ESGE 2015 : **Keine** Propofol-Anwendung bei Allergie auf Sojaprotein.
  - New information since 2010:
    - With respect to allergy to soy oil as a contraindication to propofol administration, evidence has appeared that refined soy oil, such as that present in propofol, could be safe for people with soy al- lergy because the allergenic proteins are removed during the re- fining process

New perspectives on propofol allergy

Conclusion. There is a lack of definitive evidence that propofol must be routinely avoided in patients with reported allergies to egg, soy, and/or peanut products. Data from clinical trials suggest that propofol is safe for patients with nonanaphylactic food allergies. Patients who do experience

Safety of propofol use in patients allergic to soy or peanut

A retrospective observational cohort study

The main finding of this study of 518 propofol anaesthetics in 401 individuals sensitised to peanut and soy was that there were no incidents of allergic reactions

Am J Health-Syst Pharm. 2021;78:2195-2203
Eur J Anaesthesiol 2019; 36:303–313

Sedation – Entlassung

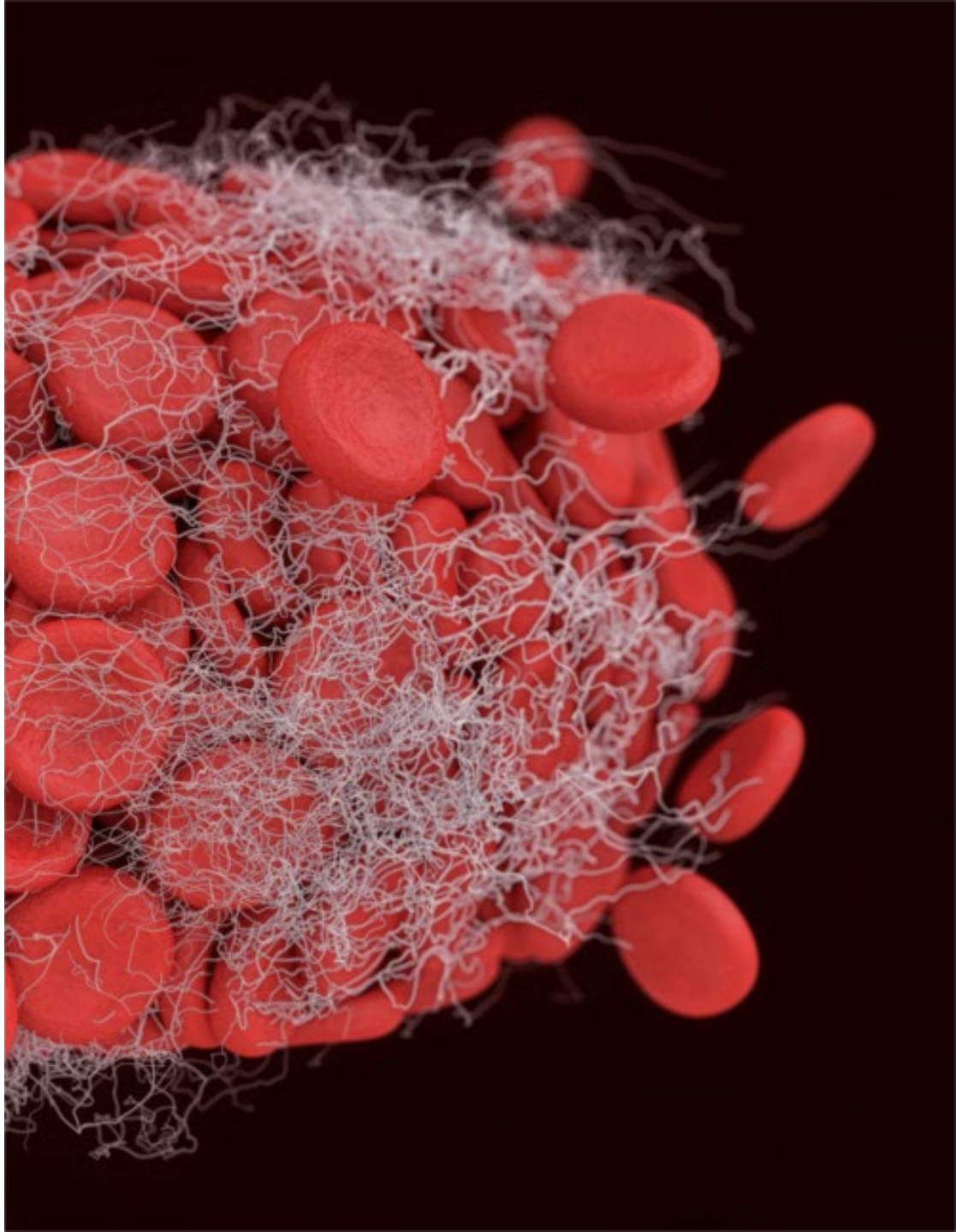
Table 7 Minimal criteria for patient discharge after sedated endoscopy. (Adapted from Ead et al. J Perianesth Nurs 2006; 21: 259 – 267)

- Stable vital signs for at least 1 hour
- Alert and oriented to time, place, and person (infants and patients whose mental status was initially abnormal should have returned to their baseline status)
- No excessive pain, bleeding, or nausea
- Ability to dress and walk with assistance
- Discharged home with a responsible adult who will remain with the patient overnight to report any post-procedure complications
- Written and verbal instructions outlining diet, activity, medications, follow-up appointments, and a phone number to be called in case of emergency
- A contact person, and circumstances that warrant seeking the assistance of a healthcare professional clearly outlined
- Toleration of oral fluids not mandatory, unless specified by physician (e. g., patient is diabetic, frail, and/or elderly; not able to tolerate an extended period of NPO status)

Parameter	Score*
Vital signs	2=Lower than the 20% of preoperative value 1=Between 20% and 40% of preoperative value 0=Higher than the 40% preoperative value
Activity and mental status	2=Oriented and has a steady gait 1=Oriented or has a steady gait 0=Neither oriented nor has a steady gait
Pain, nausea and/or vomiting	2=None or minimal 1=Moderate, required treatment was given 0=Severe, requires treatment
Surgical bleeding	2=Minimal 1=Moderate 0=Severe

Dumonceau J-M et al. European Curriculum for Sedation Training in Gastrointestinal Endoscopy… Endoscopy 2013; 45: 496–504

Gerinnung



Preprocedural assessment of a possible bleeding diathesis in patients not taking antiplatelet agents and oral anticoagulants

1. Tendency to prolonged/unusual bleeding (epistaxis, small cuts) requiring medical consultation or treatment?
2. Tendency to significant bruising/hematoma (>2 cm) without trauma or very significant after minor trauma?
3. Prolonged bleeding after tooth extraction?
4. Major bleeding after surgery (e.g., after circumcision or tonsillectomy)?
5. For women: menorrhagia leading to medical consultation or treatment (oral contraception, antifibrinolytic, iron substitution etc.)?
6. Family history of a bleeding disorder (von Willebrand disease, hemophilia, other)?

If >2 questions answered with “yes” → consult hematology

Ref.: S. Molliex et al. Annales Francaises d`Anesthésie et de Réanimation 31 (2012) 752-763

Consider measurement of Tc and INR independent of the results above:
- In patients with liver cirrhosis or severe renal insufficiency
- Before transcutaneaous liver biopsy and liver FNA

Ref.: BSG Guidelines on the use of Liver Biopsy in Clinical Practice. Oktober 2004
AASLD Position Paper. Liver Biopsy. Hepatology, Vol. 49; No. 3, 2009

Indication for anticoagulation and risk stratification

Indication for anticoagulation			
Risk Category	**Mechanical heart valve**	**Atrial fibrillation**	**Venous thromboembolism (VTE)**
High	• Mitral position (any) • Aortic position (only older like caged-ball or tilting disc) • TIA/stroke within 3 months	• $CHADS_2VaSc$ score ≥ 7 • TIA/stroke within 3 months • Rheumatic valvular heart disease	• VTE within 3 months • Severe thrombophilia – Protein C deficiency – Protein S deficiency – Antithrombin deficiency – Antiphospholipid antibodies • Multiple thrombophilias • Venocaval filter • Active cancer: pancreatic, gastric, brain, myeloproliferative
Moderate	• Bileaflet aortic valve prosthesis plus 1 of: – Atrial fibrillation – Prior TIA/stroke – Hypertension – Diabetes – Congestive heart failure – Age > 75	• $CHADS_2VaSc$ score 5 or 6	• VTE within 3-12 months • Nonsevere thrombophilia (e.g. heterozygous factor V Leiden or prothrombin gene mutation) • Recurrent VTE • Cancer within 5 years
Low	• Bileaflet aortic valve prosthesis	• $CHADS_2VaSc$ ≤ 4	• Single VTE > 12 months

Table 3a: Empiric peri-procedural thromboembolic risk stratification for patients receiving anticoagulant therapy (adapted from Ref. 7). TIA, transient ischemic attack; CHADS2VaSc score range: 1–9; risks include congestive heart failure (1 point), hypertension (1 point), age 75 or older (2 points) or 65 or older (1 point), diabetes mellitus (1 point), previous stroke, transient ischemic attack or thromboembolism (2 points), female sex (1 point), and vascular disease (1 point).

Indication for antiplatelet agents and risk stratification

High risk of thrombosis	Low risk of thrombosis
Drug-eluting coronary artery stents within 6 months of elective placement within 12 months of emergency placement (ACS)	Ischemic heart disease without coronary stents
Drug-coated balloon within 4 weeks of dilatation	Cerebrovascular disease
	Peripheral vascular disease

Table 3b: Risk stratification for discontinuation of P2Y12 receptor antagonists (clopidogrel, prasugrel or ticagrelor) based on the risk of thrombosis (adapted from Ref. 8). ACS, acute coronary syndrome.

Procedures with low/moderate bleeding risk .

Low/moderate bleeding risk procedures (30-d risk of major bleed ≤2%)
Gastroscopy +/- biopsy
Colonoscopy +/- biopsy
Polypectomy (<1cm), especially using cold snare technique
Endosonography without fine-needle aspiration
Endoscopic retrograde cholangiopancreatography without sphincterotomy, with (biliary or pancreatic) stent placement, with papillary balloon dilatation
Video capsule endoscopy
Push enteroscopy and diagnostic device-assisted enteroscopy
Argon plasma coagulation
Balloon dilatation of luminal stenosis
Enteral stent deployment
Marking (including clipping, electrocoagulation, tattooing)

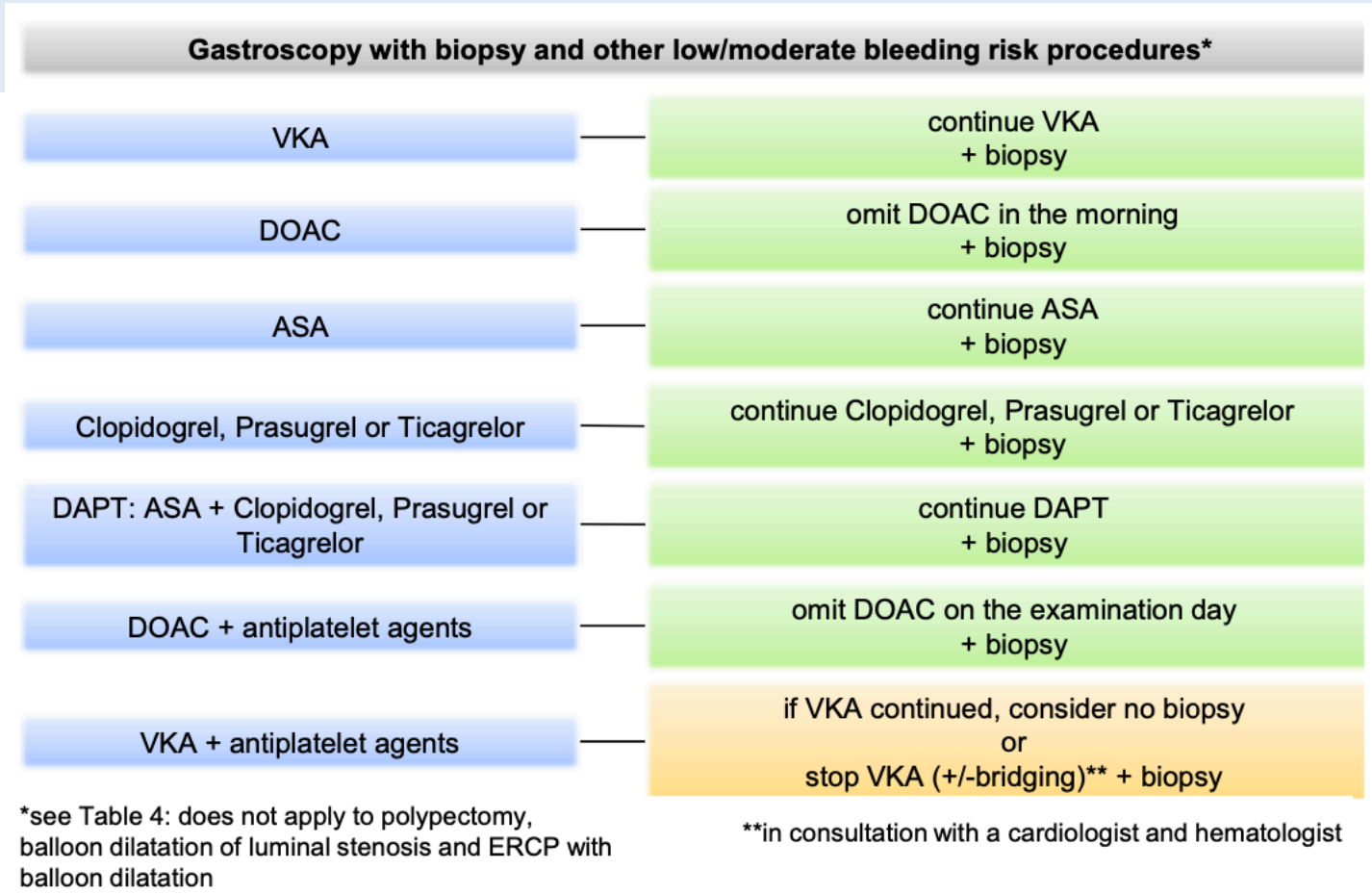


Figure 1: Management of patients on antithrombotic therapy in the elective peri-procedural setting of low/moderate bleeding risk procedures. VKA, vitamin K antagonists; DOAC, direct oral anticoagulants; ASA, acetylsalicylic acid; DAPT, dual antiplatelet therapy; ERCP, endoscopic retrograde cholangiopancreatography.

Procedures with high bleeding risk

High bleeding risk procedures (30-d risk of major bleed >2%)
Polypectomy (≥1cm)
Endoscopic mucosal resection
Endoscopic submucosal dissection
Endosonography with fine-needle aspiration
Endoscopic retrograde cholangiopancreatography with biliary or pancreatic sphincterotomy
Therapeutic device-assisted enteroscopy
Ampullectomy
Cystogastrostomy
Endoscopic hemostasis (excl. Argon plasma coagulation)
Laser ablation (incl. tumor ablation) & coagulation
Percutaneous endoscopic gastrostomy / jejunostomy
Pneumatic or bougie dilatation for esophageal strictures
Pneumatic dilatation or peroral endoscopic myotomy for achalasia
Radiofrequency ablation
Treatment of varices (incl. band ligation)
Zenker Diverticulotomy

High bleeding risk procedures* (except polypectomy in the colon)	
VKA low/moderate thromboembolic risk (see Table 3a)	stop VKA without bridging
VKA high thromboembolic risk (see Table 3a)	stop VKA with bridging
DOAC	stop DOAC without bridging
ASA	continue ASA consider stopping in polypectomy in the upper GI-tract, ampullectomy, wide field EMR, ESD, POEM, RFA
Clopidogrel, Prasugrel or Ticagrelor	stop Clopidogrel, Prasugrel, Ticagrelor or switch to ASA**
DAPT: ASA + Clopidogrel, Prasugrel or Ticagrelor	stop Clopidogrel, Prasugrel or Ticagrelor**
VKA or DOAC + ASA	stop VKA (+/- bridging) or stop DOAC***
VKA or DOAC + Clopidogrel, Prasugrel or Ticagrelor	stop VKA (+/- bridging) or stop DOAC, switch to ASA, or stop Clopidogrel, Prasugrel or Ticagrelor***
VKA or DOAC + DAPT	stop VKA (+/- bridging) or stop DOAC, stop Clopidogrel, Prasugrel or Ticagrelor***

* see Table 4: does not apply to polypectomy in the colon

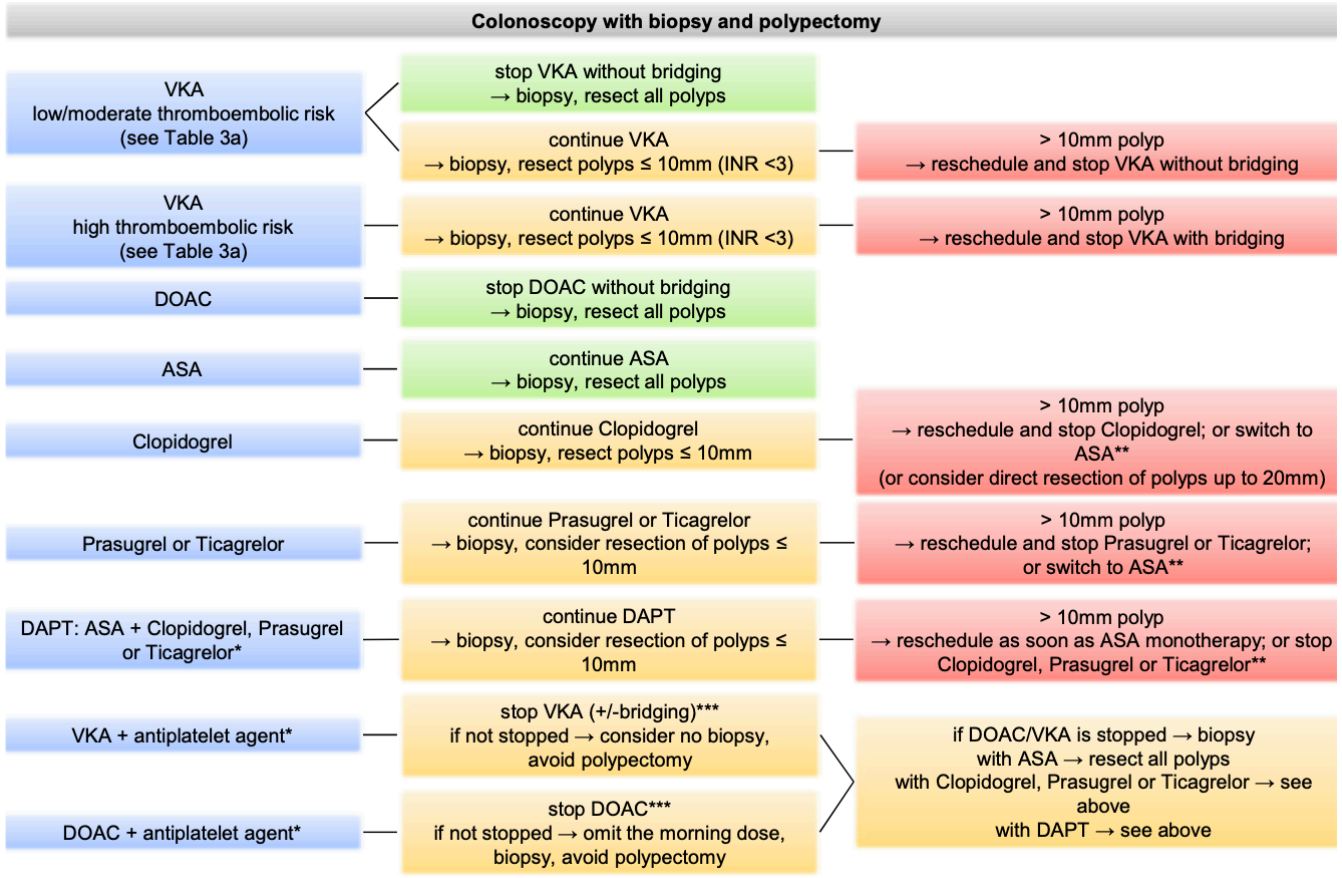
** see Table 3b: in low risk condition you can stop Clopidogrel, Prasugrel or Ticagrelor; in high risk condition consult a cardiologist and hematologist before you stop Clopidogrel, Prasugrel or Ticagrelor

*** in consultation with a cardiologist and hematologist

Koloskopie

	Polypectomy in the colon is safe on*	Polypectomy in the colon is probably safe on*
Low bleeding risk **Polyp up to 1cm** (small polyp)	**ASA** **Clopidogrel**	**ASA+Clopidogrel** **VKA** **DOAC**
High bleeding risk **Polyp 1-2cm** (large polyp)	**ASA**	**Clopidogrel**
Very high bleeding risk **Polyp >2cm** (very large polyp)		**ASA**

Table 5: Polypectomy in the colon on ASA (acetylsalicylic acid), Clopidogrel, VKA (vitamin K antagonists) and DOAC (direct oral anticoagulants). *with preventive measures (clip, coagulation, loop, etc.); if applicable, cold snare polypectomy technique preferred.



* deferring elective procedure should be considered until monotherapy

** see Table 3b: in low risk condition, you can stop Clopidogrel, Prasugrel or Ticagrelor; in high risk condition, consult a cardiologist and hematologist before you stop Clopidogrel, Prasugrel or Ticagrelor

*** in consultation with a cardiologist and hematologist

Figure 2: Management of patients on antithrombotic therapy in the elective peri-procedural setting of colonoscopy with biopsy and polypectomy. VKA, vitamin K antagonists; DOAC, direct oral anticoagulants; ASA, acetylsalicylic acid; DAPT, dual antiplatelet therapy.

	When to Stop			When to Resume
Marcoumar® - without bridging	day -7 to -5 day -1	stop Marcoumar® INR >1.5: Vit. K 1-2.5 mg po/iv		start Marcoumar® same evening (or within 24h) without loading dose once endoscopic hemostasis is achieved**
Marcoumar® - with bridging	day -7 to -5 day -4 to -2 day -1 last LMWH dose the evening before procedure	stop Marcoumar® INR <2: start LMWH* INR >1.5: Vit. K 1-2.5mg po/iv		start LMWH ≥ 6h after procedure once endoscopic hemostasis is achieved start Marcoumar® same evening without loading dose stop LMWH as soon as INR has therapeutic range**
Sintrom® - without bridging	day -3 day -1	stop Sintrom® INR >1.5: Vit. K 1-2.5 mg po/iv		start Sintrom® same evening (or within 24h) without loading dose once endoscopic hemostasis is achieved**
Sintrom® - with bridging	day -4 to -3 day -3 to -2 day -1 last LMWH dose the evening before procedure	stop Sintrom® INR <2: start LMWH* INR >1.5: Vit. K 1-2.5mg po/iv		start LMWH ≥ 6h after procedure once endoscopic hemostasis is achieved start Sintrom® same evening without loading dose stop LMWH as soon as INR has therapeutic range**
DOAC*** Rivaroxaban (R) Apixaban (A) Edoxaban (E) Dabigatran (D)		omit before procedure (days)		start DOAC once endoscopic hemostasis is achieved, usuallly the next day (or within 48h)**
	CrCl (ml/min)	R, A, E	D	
	<80	2	2	
	50-80	2	3	
	30-50	2	4	
	15-30	2	contraindicated	
	<15	not recomm.	contraindicated	
ASA, Clopidogrel, Prasugrel, Ticagrelor	omit 7 days before procedure			start within 24-48h following the procedure**
switch $P2Y_{12}$Inhibitor (Clopidogrel, Prasugrel or Ticagrelor) to ASA (ASA-bridging)	overlap at least 1 day: day -6: $P2Y_{12}$Inhibitor + ASA day -5 to day 0: ASA			day +1 to day +5: ASA day +6: ASA + $P2Y_{12}$Inhibitor after day +7: $P2Y_{12}$Inhibitor

* bid (full dose) in high risk, once daily (half dose) in moderate risk (see Table 3a)

** in patients in whom there may be a clinical concern of delayed post-procedural bleeding (e.g. endoscopic retrograde cholangiopancreatography with sphincterotomy, wide field endoscopic mucosal resection, endoscopic submucosal dissection, peroral endoscopic myotomy, variceal band ligation, etc.), decisions regarding resumption should be informed based on achieving adequate hemostasis at the time of the procedure, the risk of delayed bleeding associated with the endoscopic procedure performed, the patient's risk of thrombosis, and patient preferences, in consultation with a cardiologist and hematologist

*** measurement of anti-Xa activity can be considered, if it is unclear if or when the patient stopped Rivaroxaban, Apixaban or Edoxaban

Figure 4: Management of antithrombotic agents in the elective peri-procedural setting. INR, international normalised ratio; LMWH, low-molecular-weight heparin; DOAC, direct oral anticoagulants; CrCl, creatinine clearance; ASA, acetylsalicylic acid; bid, bis in die (twice a day).

Fragen/Anregungen?