Aktiv Druck & Verlag GmbH | ISSN 0170 - 5334 I 02330

www.ai-online.info

59. Jahrgang | Dezember 2018

A&I

ANÄSTHESIOLOGIE & INTENSIVMEDIZIN

Offizielles Organ: Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin e.V. (DGAI)
Berufsverband Deutscher Anästhesisten e.V. (BDA)
Deutsche Akademie für Anästhesiologische Fortbildung e.V. (DAAF)
Organ: Deutsche Interdisziplinäre Vereinigung für Intensiv- und Notfallmedizin e.V. (DIVI)

Tetralogy of Fallot

Thrombocytopenia-Absent Radius (TAR) syndrome

orphanaesthesia

a project of the German Society
of Anaesthesiology and Intensive Care Medicine

SUPPLEMENT NR. 18 | 2018

OrphanAnesthesia –
ein krankheitsübergreifendes Projekt des Wissenschaftlichen Arbeitskreises Kinderanästhesie der Deutschen Gesellschaft für Anästhesiologie und Intensivmedizin e.V.

Ziel des Projektes ist die Veröffentlichung von Handlungsempfehlungen zur anästhesiologischen Betreuung von Patienten mit seltenen Erkrankungen. Damit will Orphan Anesthesia einen wichtigen Beitrag zur Erhöhung der Patientensicherheit leisten.

Patienten mit seltenen Erkrankungen benötigen für verschiedene diagnostische oder therapeutische Prozeduren eine anästhesiologische Betreuung, die mit einem erhöhten Risiko für anästhesieassoziierte Komplikationen einhergehen. Weil diese Erkrankungen selten auftreten, können Anästhesisten damit keine Erfahrungen gesammelt haben, so dass für die Planung der Narkose die Einholung weiterer Information unerlässlich ist. Durch vorhandene spezifische Informationen kann die Inzidenz von mit der Narkose assoziierten Komplikationen gesenkt werden. Zur Verfügung stehendes Wissen schafft Sicherheit im Prozess der Patientenversorgung.

Die Handlungsempfehlungen von OrphanAnesthesia sind standardisiert und durchlaufen nach ihrer Erstellung einen Peer-Review-Prozess, an dem ein Anästhesist sowie ein weiterer Krankheitsexperte (z.B. Pädiater oder Neurologe) beteiligt sind. Das Projekt ist international ausgerichtet, so dass die Handlungsempfehlungen grundsätzlich in englischer Sprache veröffentlicht werden.

Ab Heft 5/2014 werden im monatlichen Rhythmus je zwei Handlungsempfehlungen als Supplement der A&I unter www.ai-online.info veröffentlicht. Als Bestandteil der A&I sind die Handlungsempfehlungen damit auch zitierfähig. Sonderdrucke können gegen Entgelt bestellt werden.

Bisher in A&I publizierte Handlungsempfehlungen finden Sie unter:

www.ai-online.info/Orphsuppl
www.orphananesthesia.eu

OrphanAnesthesia –
a common project of the Scientific Working Group of Paediatric Anaesthesia of the German Society of Anaesthesiology and Intensive Care Medicine

The target of OrphanAnesthesia is the publication of anaesthesia recommendations for patients suffering from rare diseases in order to improve patients' safety. When it comes to the management of patients with rare diseases, there are only sparse evidence-based facts and even far less knowledge in the anaesthetic outcome. OrphanAnesthesia would like to merge this knowledge based on scientific publications and proven experience of specialists making it available for physicians worldwide free of charge.

All OrphanAnesthesia recommendations are standardized and need to pass a peer review process. They are being reviewed by at least one anaesthesiologist and another disease expert (e.g. paediatrician or neurologist) involved in the treatment of this group of patients.

The project OrphanAnesthesia is internationally oriented. Thus all recommendations will be published in English.

Starting with issue 5/2014, we'll publish the OrphanAnesthesia recommenations as a monthly supplement of A&I (Anästhesiologie & Intensivmedizin). Thus they can be accessed and downloaded via www.ai-online.info. As being part of the journal, the recommendations will be quotable. Reprints can be ordered for payment.

A survey of until now in A&I published guidelines can be found on:

www.ai-online.info/Orphsuppl
www.orphananesthesia.eu

Projektleitung

Prof. Dr. Tino Münster, MHBA
Geschäftsführender Oberarzt
Facharzt für Anästhesie,
Spezielle Schmerztherapie,
Notfallmedizin
Anästhesiologische Klinik
Friedrich-Alexander-Universität
Erlangen-Nürnberg
Krankenhausstraße 12
91054 Erlangen, Deutschland
Tel.: 09131 8542441
Fax: 09131 8536147
E-Mail: muenster@kfa.imed.uni-erlangen.de

Deutsche Gesellschaft für Anästhesiologie & Intensivmedizin
www.dgai.de

A&I
ANÄSTHESIOLOGIE & INTENSIVMEDIZIN
www.ai-online.info

orphanaesthesia

Anaesthesia recommendations for

Thrombocytopenia-Absent Radius (TAR) syndrome

Disease name: Thrombocytopenia-Absent Radius (TAR) syndrome

ICD 10: Q87.2

Synonyms: Absent radii and thrombocytopenia, Thrombocytopenia absent radii, Thrombocytopenia absent radius syndrome, Radial aplasia, Amegakaryocytic thrombocytopenia, Radial Aplasia Thrombocytopenia syndrome, Radial aplasia-amegakaryocytic thrombocytopenia, TAR syndrome.

Thrombocytopenia-absent radius syndrome is an uncommon congenital malformation condition characterised by bilateral absence of the radii with the presence of thumbs, and congenital thrombocytopenia. The syndrome is phenotypically variable. It is inherited in an autosomal recessive pattern caused by a 200kb deletion including or null mutation of RBM8A on one chromosome and a non-coding polymorphism in RBM8A on the other chromosome. The estimated prevalence is between 0.5-1:100,000 and 1:240,000 births. It affects both sexes equally. Over 150 cases have been previously reported.

Medicine in progress

Perhaps new knowledge

Every patient is unique

Perhaps the diagnostic is wrong

Find more information on the disease, its centres of reference and patient organisations on Orphanet: www.orpha.net

▶ **Citation:** McCaul C, Valchev G: Thrombocytopenia-Absent Radius (TAR) syndrome. Anästh Intensivmed 2018;59:S664–S672. DOI: 10.19224/ai2018.S664

Disease summary

The combination of thrombocytopenia and absent radii was first described by Greenwald and Sherman in 1929, and delineated as a syndrome with a description of cardinal manifestations by Hall et al. in 1969 [1,2].

The most common clinical features are:

Thrombocytopenia (100%) – symptomatic in over 90% of the cases within the first four months of life. Platelet counts are usually in the range of 15–30x10^9/L in infancy and improve to almost normal range by adulthood. The thrombocytopenia is thought to be secondary to impaired bone marrow production of platelets, despite normal thrombopoetin production and slightly elevated serum levels. The number of megakaryocytes in the bone marrow is strongly reduced. Platelet aggregation and survival times are reduced but overall platelet function tends to be normal and bleeding occurs secondary to low platelet numbers [3,4].

Purpura, petechiae, epistaxis, gastrointestinal bleeding, haemoptysis and haematuria are the usual symptoms. Intracerebral bleeding may also occur but is rare. Severe thrombocytopenia can be precipitated by stress, infection, gastrointestinal disturbances, pregnancy and surgery.

The risk of bleeding may be more severe than expected from the platelet count. Some clinicians suggest that advanced coagulation tests including thromboelastography and platelet function analysis may be of additional benefit before major surgery. The main cause of mortality is haemorrhage [5].

Upper extremity anomalies (100%): unilateral or bilateral absence of the radius, hand anomalies (presence of thumbs, limited extension of the fingers, hypoplasia of the carpal and phalangeal bones, ulnar, humeral and shoulder anomalies [4].

Lower limb anomalies (47%–62%): Hip and patellar dislocation, knee dysplasia or ankylosis, phocomelia, valgus and various foot deformities [4].

Cow's milk intolerance: Thrombocytopenia may be precipitated by drinking of cow's milk and relieved by its exclusion from the diet [4,6].

Urogenital anomalies (6–23%): absent uterus and horseshoe kidney [4,6].

Cardiac anomalies (22–33%): Tetralogy of Fallot, ASD, VSD [1].

Other associated congenital anomalies: micrognathia, cleft palate, intracranial vascular malformation and facial capillary haemangioma in the glabellar region, epilepsy, scoliosis [6].

The differential diagnosis of TAR syndrome includes:

Fanconi anaemia, Roberts syndrome, Holt-Oram syndrome, thalidomide embryopathy, Cornelia de Lange syndrome, VACTERL association, CHILD syndrome, Trisomy 13 and 18, and Rapadilino syndrome.

© Anästh Intensivmed 2018;59:S595-S672 Aktiv Druck & Verlag GmbH

Typical surgery

Treatment of the musculoskeletal abnormalities include orthopaedic reconstructive surgery with subsequent orthotic and prosthetic fitting, dental and orthodontic surgery, cardiac surgery, splenectomy, caesarean section, cardiac catheterization, maxillofacial surgery and plastic surgery. Hand surgery in specialised centres.

Type of anaesthesia

Regional anaesthesia may be contraindicated depending on the severity of the thrombocytepenia. Peripheral nerve or neuroaxial blocks, if performed, should take into account coagulation status and the potential risks and benefits of the technique. A safe platelet count has not been established in this syndrome but a platelet account greater than $80x10^9$/L is recommended for an epidural catheter insertion and removal [7].

The platelet account of at least $80x10^9$/L should be achieved before performing spinal anaesthesia [7].

Fisher et al. reported 9 cases in 4 patients with TAR syndrome who had successful axillary brachial plexus block for perioperative analgesia and anaesthesia [8].

Case reports have been published describing anaesthetic management of patients with TAR syndrome who had orthopaedic procedures, caesarean section, cardiac operations and/or laparoscopic surgery under general anaesthesia [8,9,10,11].

Necessary additional diagnostic procedures (preoperative)

To assess the severity of the disease in an individual diagnosed with Thrombocytopenia absent radius (TAR) syndrome, the following evaluations are recommended:

Genetic analysis (Presences of SNPs and microdeletions or mutations in RBM8A. In the presence of thumb aplasia, Fancini anaemia should be excluded through chromosomal breakage analysis.

- Platelet number and function. The values however may not fully reflect bleeding risk.
- The anatomic findings of both upper and lower limbs may lead to extreme difficulties with vascular access and limited sites for invasive and non-invasive blood pressure monitoring. Non-invasive monitoring should be used where possible.
- ECG and Echocardiography to establish the presence or the extent of any cardiac abnormalities
- Evaluation of renal structure and kidney function relevant to anaesthesia [13].

© Anästh Intensivmed 2018;59:S595-S672 Aktiv Druck & Verlag GmbH

Particular preparation for airway management

Comprehensive airway assessment is essential, especially if micrognathia and cleft palate are present, and a detailed plan for airway management should be established.

Particular preparation for transfusion or administration of blood products

As thrombocytopenia is the main clinical feature, platelet transfusion is the mainstay of the therapy. The platelets are available either as:

Random donor platelets, usually available as pheresis units; one adult therapeutic dose (ATD) is equivalent to four to six single donor units. In children the dose is 10–15 ml/kg [7].

Or:

HLA-selected platelets (as pheresis units) – product of choice for all patients with TAR syndrome [7].

The patients with TAR syndrome may require blood transfusion during highly invasive surgery and significant blood loss.

Tranexamic acid and Desmopressin (DDAVP) have been used therapeutically to prevent or manage bleeding related to thrombocytopenia [7].

Recombinant activated factor VII has been successfully used as an alternative approach to reduce significant blood loss in planned surgery [17].

There is a small number of cases describing administration of recombinant erythropoietin and recombinant interleukin [6] to induce an increase in platelet count for elective surgery in patients with TAR syndrome [14,15]. Although not studied in this patient group to date, eltrombopag and romiplostim may be the therapeutic option to increase platelet count. Consultation with a haematologist is strongly advised before considering these therapies.

Bone marrow transplantation has been reported as a choice of treatment in a patient with TAR syndrome with persistent thrombocytopenia and haemorrhagic complications [18].

Particular preparation for anticoagulation

There are no specific recommendations for anticoagulation in patients with TAR syndrome.

For the patients at risk of thrombosis, the use of anticoagulants should be weighed against the risk of bleeding in thrombocytopenia on an individual basis. The risk of thromboembolic disease in TAR syndrome has not been determined. In paediatrics, increased risk exists in those with prior DVT/PE, prolonged intensive care unit stay and those with central lines, particularly at the femoral site [21].

Mechanical prophylaxis (compression stockings, pneumatic devices and early immobilisation) should also be considered.

© Anästh Intensivmed 2018;59:S595-S672 Aktiv Druck & Verlag GmbH

For therapeutic dose anticoagulation in patients with severe thrombocytopenia, the Anglo-American cancer guidelines on anticoagulation in cancer patients recommend:

Anticoagulation is not administered, no matter what the platelet account is, in patients with life-threatening bleeding or bleeding requiring transfusion (WHO grade III/IV). Consider a vena cava filter in DVT patients [15]. In all other patients (no bleeding, petechiae, haematomas, stable Hb (WHO grade 0/I/II) consider anticoagulation [15]. In patients with platelets counts ≥50 $x10^9$/L, start standard dose anticoagulation [15]. With lower counts < 50 $x10^9$/L, give half standard dose and increase to full dose when platelets are ≥50 $x10^9$/L [15].

Particular precautions for positioning, transport or mobilisation

The patients with TAR syndrome are typically short, with multiple musculoskeletal abnormalities, have undergone numerous surgeries and have some orthopaedic adaptive devices in place. Meticulous attention to protect pressure points and the limbs during the transport and positioning on the operating table is needed.

Probable interaction between anaesthetic agents and patient's long-term medication

No drug interactions have been described.

Avoid NSAIDs and aspirin (possible exacerbation of platelet dysfunction).

Anaesthesiologic procedure

Patients with TAR syndrome are considered as high anaesthetic risk patients and should be assessed in a preoperative assessment clinic or by experienced consultants prior to surgery.

Multiple venous cannulations prior to surgery and anatomic abnormalities may result in extreme difficulties with venous and arterial access. Ultrasound guidance may be useful for vascular access [9].

Micrognathia is present in over 50% of patients and may be associated with difficult intubation [5].

Particular or additional monitoring

Placement of the blood pressure cuff may be challenging or impossible. Femoral or brachial access should be considered as alternatives for invasive monitoring.

Tunnelled or peripherally inserted central lines may be beneficial for multiple surgeries requiring administration of blood products and blood sampling perioperatively [9,18].

© Anästh Intensivmed 2018;59:S595-S672 Aktiv Druck & Verlag GmbH

Possible complications

Due to the presence of cardiac disease, there may be an increase in the risk of paradoxical embolism.

Higher risk of blood-borne diseases and alloimmunisation due to frequent transfusion.

Bleeding from the surgical site, central and arterial lines, the throat and the trachea (LMA and ETT) and neuraxial blocks attributable to the thrombocytopenia.

Postoperative care

High dependency unit/ Intermediate care is recommended for 24 hours with very close attention to the coagulation status.

Information about emergency-like situations / Differential diagnostics

caused by the illness to give a tool to distinguish between a side effect of the anaesthetic procedure and a manifestation of the disease

Thrombocytopenia may be exacerbated by intercurrent illness, particularly infection.

Ambulatory anaesthesia

Suitability for day care depends on the severity of the disease and the surgical procedure.

Obstetrical anaesthesia

Thrombocytopenia may be exacerbated during pregnancy.

The main considerations in peripartum care are the impact of thrombocytopenia on feasibility of neuraxial blockade, surgical bleeding and difficult vascular access.

A detailed strategy should be made in advance between the haematologist, obstetrician and anaesthetist.

A safe level of platelet count for performing a neuraxial block has not been established. Neither neuraxial anaesthesia nor analgesia have been described for patients with TAR syndrome to date.

Remifentanil PCA for analgesia in labour and a multimodal approach with opioid PCA for analgesia post caesarean section are alternative strategies.

Anaesthetic management of a parturient with TAR syndrome for caesarean section has been reported by Lynch and al. and has been complicated by marked thrombocytopenia and difficult vascular access [9].

© Anästh Intensivmed 2018;59:S595-S672 Aktiv Druck & Verlag GmbH

Another case of anaesthetic management of a primigravida with TAR syndrome and thrombocytopenia aggravated at her late pregnancy successfully treated with steroids has been described by Bot-Robin et al. [19].

Assessment of coagulopathy in a patient with TAR syndrome undergoing caesarean section using TEG has been reported by Gauthama et al. but remains unvalidated [16].

Wax et al. have reported maternal thrombocytopenia-absent radius syndrome complicated by severe pre-eclampsia and highlighted the importance of advanced planning for vascular access, choice of anaesthetic technique and collaboration with local blood bank [20].

Literature and internet links

1. Hall JG, Levin J, Kuhn JP, Ottenheimer EJ, van Berkum P, McKusick VA. Thrombocytopenia with absent radius (TAR). Medicine 1969;48:411–439
2. Shaw S, Oliver RAM. Congenital hypoplastic thrombocytopenia with skeletal deformities in siblings. Blood 1959;14:374–377
3. H Chen. Atlas of Genetic Diagnosis and Counseling, Human Press Inc.: Totowa, NJ, USA 2006
4. JG Hall. Thrombocytopenia and absent radius (TAR) syndrome. J Med Genet 1987;24:79–83
5. Greenhalgh K, Howell R, Bottani A, Ancliff P, Brunner H, Verschuuren-Bemel C, et al: Thrombocytopenia-absent radius syndrome: A clinical genetic study. J Med Genet 2002;39:876–881
6. Naseh A, Hafizi A, Malek F, Mozdarani H, Yassaee VR: TAR Syndrome, A Rare Case Report with Cleft Lip/Palate. The Internet J Pediatr Neonatol 2012;14:1
7. Paula HB, Bolton-Maggs EA, Chalmers A, Collins PW, Harrison P, Kitchen S, et al: A review of inherited platelet disorders with guidelines for their management on behalf of the UKHCDO Br J Haematol 2006;135:603–633
8. Fisher WJ, Bingham RM, Hall R. Axillary brachial plexus block for perioperative analgesia in 250 children. Pediatr Anesth 1999;9:435–438
9. Lynch JC. McCaul CL. Management of a parturient with thrombocytopenia-absent-syndrome undergoing urgent caesarean section. Inter J Obstet Anesth 2008;17:74–77
10. Gurer O, Kirbas A, Ugurlucan M, Isik O. Mitral valve repair in a patient with thrombocytopenia-absent radius syndrome: case report. Heart Surg Forum 2010;13:336–338
11. Griesinger G, Dafopoulos K, Schultze-Mosgau A, Schroder A, Felberbaum R, Diedrich K. Mayer-Rokitansky-Küster-Hauser syndrome associated with thrombocytopenia-absent radius syndrome. Fertil Steril 2005;83:452–454
12. Toriello HV, PhD. GeneReviews® Thrombocytopenia Absent Radius Syndrome. In: Pagon RA, Adam MP, Bird TD et al (editors) Seattle (WA): University of Washington, Seattle; 1993–2014. http://www.ncbi.nlm.nih.gov/books/NBK23758/
13. Dempfle CE, Burck C, Grutzmacher T, et al. Increase in platelet count in response to rHuEpo in patient with thromboctopenia and absent radii syndrome. Blood 2001;97:2189–2190
14. Aquino VM, Mustafa MM, Vackus L, et al. Recombinant interleukin-6 in the treatment of congenital thrombocytopenia associated with absent radii. J Pediatr Hematol Oncol 1998;20 (5):474–476
15. Matzdorff A, Beer JH. Immune thrombocytopenia patients requiring anticoagulation--maneuvering between Scylla and Charybdis. Semin Hematol 2013;50 Suppl 1:83–88. DOI: 10.1053/j.seminhematol.2013.03.020
16. Gauthama P, Maybury H, Brooks H. Management of a parturient with TAR syndrome during caesarean section and the use of thromboelastography. Inter J Obstet Anesth 2011;20:368–369. DOI:10.1016/j.ijoa.2011.07.004
17. Coppola A, Simone CD, Palmieri NM, Coppola D, Lanza F, Ruosi C, et al: Recombinant activated factor VII for hemostatic cover of orthopedic interventions in a girl with thrombocytopenia with absent radii syndrome. Blood Coagul Fibrinolysis 2007;18:199–201
18. Brochstein JA, Shank B, Kernan NA, Terwilliger JW, O'Reilly RJ. Marrow transplantation for thrombocytopenia-absent radii syndrome. J Pediatr 1992;121:587–589
19. Bot-Robin V, Vaast P, Deruelle P. Exacerbation of thrombocytopenia in a pregnant woman with thrombocytopenia-absent radius syndrome. Inter J Gynecol Obstet 2011;114:77–78. DOI: 10.1016/j.ijgo.2011.01.019
20. Wax JR, Crabtree C, Blackstone J, Pinette MG, Cartin A. Maternal thrombocytopenia-absent radius syndrome complicated by severe pre-eclampsia. J Matern-Fetal Neonatal Med 2009; 22:175–177
21. Sandoval JA, Sheehan MP, Stonerock CE, Shafique S, Rescorla FJ, DFalsing MC. Incidence, risk factors, and treatment patterns for deep venous thrombosis in hospitalized children: an increasing population at risk. J Vasc Surg 2008;47:837–843.

© Anästh Intensivmed 2018;59:S595-S672 Aktiv Druck & Verlag GmbH

Last date of modification: May 2015

These guidelines have been prepared by:

Author
Conan McCaul, Anaesthesiologist, The Rotunda Hospital, Dublin, Ireland
cmccaul@rotunda.ie

Co-Author
Georgi Valchev, Anaesthesiologist, The Rotunda Hospital, Dublin, Ireland
valchevil@gmail.com

Peer Revision 1
Helga Toriello, Department of Clinical Genetics, Spectrum Health Hospitals, Grand Rapids, Michigan, USA
Helga.Toriello@hc.msu.edu

Peer Revision 2
Harald Schulze, Department of Haemostaseology, University Hospital Wuerzburg, Germany
harald.schulze@uni-wuerzburg.de

Please note that this guideline has not been reviewed by an anaesthesiologist but by two disease experts instead.

© Anästh Intensivmed 2018;59:S595-S672 Aktiv Druck & Verlag GmbH

Herausgeber

DGAI
Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin e.V.
Präsident: Prof. Dr. B. Zwißler, München

BDA
Berufsverband Deutscher Anästhesisten e.V.
Präsident: Prof. Dr. G. Geldner, Ludwigsburg

DAAF
Deutsche Akademie für Anästhesiologische Fortbildung e.V.
Präsident: Prof. Dr. F. Wappler, Köln

Korrespondenzadresse: Roritzerstraße 27 | 90419 Nürnberg | Deutschland
Tel.: 0911 9337812 | Fax: 0911 3938195
E-Mail: anaesth.intensivmed@dgai-ev.de

Verlag & Druckerei

Aktiv Druck & Verlag GmbH
An der Lohwiese 36 |
97500 Ebelsbach | Deutschland
www.aktiv-druck.de

Geschäftsführung
Wolfgang Schröder | Jan Schröder | Nadja Schwarz
Tel.: 09522 943560 | Fax: 09522 943567
E-Mail: info@aktiv-druck.de

Anzeigen | Vertrieb
Pia Engelhardt
Tel.: 09522 943570 | Fax: 09522 943577
E-Mail: anzeigen@aktiv-druck.de

Verlagsrepräsentanz
Jürgen Distler
Roritzerstraße 27, 90419 Nürnberg
Tel.: 0171 9432534 | Fax: 0911 3938195
E-Mail: jdistler@bda-ev.de

Herstellung | Gestaltung
Manfred Wuttke | Stefanie Triebert
Tel.: 09522 943571 | Fax: 09522 943577
E-Mail: ai@aktiv-druck.de

Titelbild
Dipl.-Designerin Monique Minde, Nürnberg

Erscheinungsweise 2018
Der 59. Jahrgang erscheint jeweils zum Monatsanfang, Heft 7/8 als Doppelausgabe.

Bezugspreise (inkl. Versandkosten):

- **Einzelhefte** 30,- €
- **Jahresabonnement:**
  Europa (ohne Schweiz) (inkl. 7 % MwSt.) 258,- €
  Schweiz 266,- €
  Rest der Welt 241,- €

Mitarbeiter aus Pflege, Labor, Studenten und Auszubildende (bei Vorlage eines entsprechenden Nachweises)
Europa (ohne Schweiz) (inkl. 7 % MwSt.) 94,- €
Schweiz 90,- €
Rest der Welt 94,- €

Für Mitglieder der DGAI und/oder des BDA ist der Bezug der Zeitschrift im Mitgliedsbeitrag enthalten.

Allgemeine Geschäfts- und Lieferbedingungen
Die allgemeinen Geschäfts- und Lieferbedingungen entnehmen Sie bitte dem Impressum auf www.ai-online.info

Indexed in **Current Contents®/Clinical Medicine, EMBASE/Excerpta Medica; Medical Documentation Service; Research Alert; Sci Search; SUBIS Current Awareness in Biomedicine; VINITI: Russian Academy of Science.**

Online-Ausgabe der A&I ab April 2017 open access: **www.ai-online.info**

CONTACT US

Please do not hesitate to contact us. We will be glad to answer and provide further information to you at any time.

.....
Name

.....
First Name

.....
Department / Hospital

.....
Place

.....
Telephone

.....
E-Mail

.....
Date / Signature

Please contact me for further information ○

I would like to participate in the project ○

ADDRESS

German Society of Anaesthesiology and
Intensive Care Medicine
Ursula Homberg
Roritzerstrasse 27 | 90419 Nuremberg | Germany
Tel.: +49-911-9337828 | Fax: +49-911-3938195
Email: uhomberg@orphananesthesia.eu