Gemeinsamer Bundesausschuss

Kriterien zur Bestimmung der zweckmäßigen Vergleichstherapie

und

Recherche und Synopse der Evidenz zur Bestimmung der zweckmäßigen Vergleichstherapie nach § 35a SGB V

Vorgang: 2018-04-01-D-351 Patiromer

Stand: August 2016

I. Zweckmäßige Vergleichstherapie: Kriterien gemäß 5. Kapitel § 6 VerfO G-BA

Patiromer **Behandlung der Hyperkaliämie bei Erwachsenen**	
Kriterien gemäß 5. Kapitel § 6 VerfO	
Sofern als Vergleichstherapie eine Arzneimittelanwendung in Betracht kommt, muss das Arzneimittel grundsätzlich eine Zulassung für das Anwendungsgebiet haben.	Poly(styrol-co-divinylbenzol)-sulfonsäure, als Calcium- oder Natriumsalz
Sofern als Vergleichstherapie eine nicht-medikamentöse Behandlung in Betracht kommt, muss diese im Rahmen der GKV erbringbar sein.	Nicht angezeigt.
Beschlüsse/Bewertungen/Empfehlungen des Gemeinsamen Bundesausschusses zu im Anwendungsgebiet zugelassenen Arzneimitteln/nicht-medikamentösen Behandlungen	Es liegen keine Beschlüsse zur Hyperkaliämie vor.
Die Vergleichstherapie soll nach dem allgemein anerkannten Stand der medizinischen Erkenntnisse zur zweckmäßigen Therapie im Anwendungsgebiet gehören.	*Siehe systematische Literaturrecherche*

II. Zugelassene Arzneimittel im Anwendungsgebiet

Wirkstoff **ATC-Code** **Handelsname**	**Anwendungsgebiet** (Text aus Fachinformation)
Zu bewertendes Arzneimittel:	
Patiromer ATC: V03AE Name: Veltassa™	Behandlung der Hyperkaliämie bei Erwachsenen.
Poly(styrol-co-divinylbenzol)-sulfonsäure, als Salz ATC: V03AE01 (z.B. Resonium A®, CPS Pulver®, …)	Behandlung der Hyperkaliämie.

Quellen: AMIS-Datenbank, Fachinformationen, Lauer-Fischer Taxe

Gemeinsamer Bundesausschuss

Abteilung Fachberatung Medizin

Recherche und Synopse der Evidenz zur Bestimmung der zweckmäßigen Vergleichstherapie nach § 35a SGB V

Vorgang: 2016-B-082 (Patiromer)

Auftrag von:	Abt. AM
bearbeitet von:	Abt. FB Med
Datum:	29.06.2016

Recherche und Synopse der Evidenz zur Bestimmung der zweckmäßigen Vergleichstherapie (zVT):

Inhalt

Systematische Recherche:

Es wurde eine systematische Literaturrecherche nach systematischen Reviews, Meta-Analysen, HTA-Berichten und Evidenz-basierten systematischen Leitlinien zur Indikation Hyperkaliämie durchgeführt. Der Suchzeitraum wurde auf die letzten 5 Jahre eingeschränkt und die Recherche am 16.06.2016 abgeschlossen. Die Suche erfolgte in folgenden Datenbanken bzw. Internetseiten folgender Organisationen: The Cochrane Library (Cochrane Database of Systematic Reviews, Health Technology Assessment Database), MEDLINE (PubMed), AWMF, Clinical Evidence, DAHTA, G-BA, GIN, IQWiG, NGC, NICE, TRIP, SIGN, WHO. Ergänzend erfolgte eine freie Internetsuche nach aktuellen deutschen und europäischen Leitlinien. Die detaillierte Darstellung der Suchstrategie ist am Ende der Synopse aufgeführt.

Die Recherche ergab 117 Quellen, die anschließend in einem zweistufigen Screening-Verfahren nach Themenrelevanz und methodischer Qualität gesichtet wurden. Zudem wurde eine Sprachrestriktion auf deutsche und englische Quellen vorgenommen. Insgesamt ergab dies 2 Quellen, die in die synoptische Evidenz-Übersicht aufgenommen wurden.

Indikation:

Zur Behandlung der Hyperkaliämie bei Erwachsenen.

Berücksichtigte Wirkstoffe/Therapien:

Übersicht zVT, Tabellen „I. Zweckmäßige Vergleichstherapie“ und „II. Zugelassene Arzneimittel im Anwendungsgebiet.“

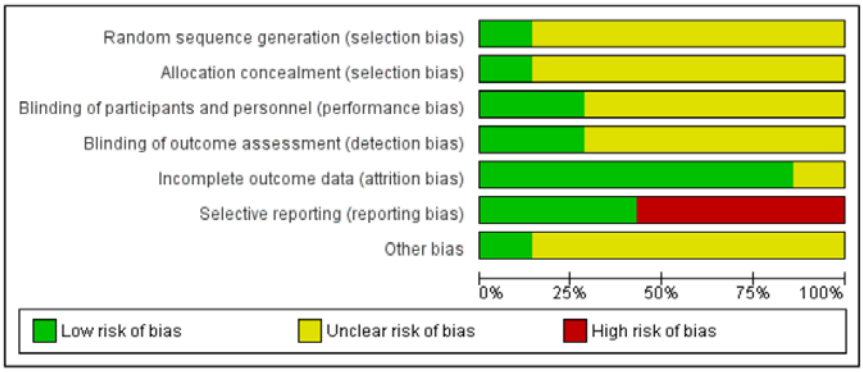
Abkürzungen:

Akdae	Arzneimittelkommission der deutschen Ärzteschaft
AWMF	Arbeitsgemeinschaft der wissenschaftlichen medizinischen Fachgesellschaften
DAHTA	Deutsche Agentur für Health Technology Assessment
G-BA	Gemeinsamer Bundesausschuss
GIN	Guidelines International Network
IQWiG	Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen
NGC	National Guideline Clearinghouse
NICE	National Institute for Health and Care Excellence
SIGN	Scottish Intercollegiate Guidelines Network
TRIP	Turn Research into Practice Database
WHO	World Health Organization

IQWiG-Berichte/G-BA-Beschlüsse

Es konnten keine relevanten IQWiG-Berichte/G-BA-Beschlüsse zum AWG identifiziert werden.

Cochrane Reviews

Batterink J et al., 2015 [1]. Pharmacological interventions for the acute management of hyperkalaemia in adults.	1. Fragestellung This review looked at the benefits and harms of pharmacological treatments used in the acute management of hyperkalaemia in adults. This review evaluated the therapies that reduce serum potassium as well as those that prevent complications of hyperkalaemia.
	2. Methodik Population: The study population of this review was adults (aged 18 years and over) with hyperkalaemia receiving pharmacological therapy to reduce serumpotassiumor to prevent arrhythmias. (Hyperkalaemia was defined as serum potassium concentration ≥ 4.9 mmol/L.) Intervention: All pharmacological therapies used in the short-termmanagement of hyperkalaemia were considered, including interventions used to reduce serum potassium as well as therapies used to prevent arrhythmias. Komparator: placebo or another pharmacological therapy Endpunkte: primary: Serum potassium, Mortality, Arrhythmias; secondary: Dialysis, ECG changes, Adverse events Suchzeitraum (Aktualität der Recherche): bis 08/2015 Anzahl eingeschlossene Studien/Patienten (Gesamt): 7 studies/241 participants Qualitätsbewertung der Studien: The following items were independently assessed by at least two authors using the risk of bias assessment tool. *Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies* 
	3. Ergebnisdarstellung

	• No study evaluated the efficacy of pharmacological interventions for preventing clinically relevant outcomes such as mortality and cardiac arrhythmias *Sodium polystyrene or other potassium-binding resins:* • No published RCTs evaluating sodium polystyrene or other potassium-binding resins in hyperkalaemic patients, so we cannot comment on the efficacy of this intervention *Sodium bicarbonate versus placebo:* • No studies compared sodium bicarbonate with placebo *IV calcium:* • No RCTs found evaluating IV calcium for the treatment of hyperkalaemia
	4. Anmerkungen/Fazit der Autoren Evidence for the acute pharmacological management of hyperkalaemia is limited, with no clinical studies demonstrating a reduction in adverse patient outcomes. Of the studied agents, salbutamol via any route and IV insulin-dextrose appear to be most effective at reducing serum potassium. There is limited evidence to support the use of other interventions, such as IV sodium bicarbonate or aminophylline. The effectiveness of potassium binding resins and IV calcium salts has not been tested in RCTs and requires further study before firm recommendations for clinical practice can be made. <u>*Quality of evidence:*</u> The quality of the evidence evaluating pharmacological therapies for reducing serum potassium is generally poor. There was insufficient reporting of allocation procedures, blinding and statistical techniques in nearly all studies. However, the outcome evaluated by most studies (serum potassium) is objective so these methodological short-comings may not have biased the results to any great extent. <u>*Overall completeness and applicability of evidence:*</u> The evidence for acute pharmacological management of hyperkalaemia is strikingly incomplete. For example, sodium polystyrene sulphonate and other potassium-binding resins are routinely used to decrease serum potassium despite a lack of RCTs evaluating these medications in hyperkalaemic patients. Similarly, IV calcium is commonly administered to patients with hyperkalaemia for membrane stabilization despite the absence of any clinical studies to support its use. This shortage of prospective, clinical outcome data likely relates to ethical concerns associated with using endpoints such as cardiac arrhythmia or death. Clinicians cannot justify placebo-controlled studies when available observational data suggests that patient outcomes are poor when hyperkalaemia is left untreated.

	5. Hinweise durch FB Med • Im Ergebnisteil wurden nur die zugelassenen Interventionen dargestellt

Systematische Reviews

Es konnten keine relevanten systematischen Reviews im betreffenden AWG identifiziert werden.

Leitlinien

UK Renal Association, 2014 [2]. Clinical practice guideline treatment of acute hyperkalaemia in adults	Fragestellung/Zielsetzung: This guideline has been developed to improve the treatment of acute hyperkalaemia and reduce the risk of complications associated with hyperkalaemia and its treatment. **Scope** This guideline focuses on the recognition and emergency treatment of acute hyperkalaemia in adults in secondary care settings. It is applicable to clinicians in all specialties. This guideline does not comprehensively cover the treatment of hyperkalaemia in out-patient or primary care settings.
	Methodik Grundlage der Leitlinie: Suchzeitraum: The literature was reviewed using a multiple database search - The Cochrane Library (1995-2013), Ovid MEDLINE (1946-2013), EMBASE (1974-2013), PubMed (1960-2013), Up-to-Date (2011), Web of Knowledge (2001-2013). The keywords used for literature search were – hyperkalaemia, potassium, treatment, arrhythmias, insulin, salbutamol, calcium, dialysis and cardiac arrest. LoE und GoR: The recommendations in each guideline statement have been graded using the GRADE system in evaluating the strength of each recommendation (1 = strong, 2 = weak) and quality of evidence (A= high, B = moderate, C= low, D = very low). Each guideline statement begins with a recommendation (Grade 1 evidence) or a suggestion (Grade 2 evidence). Sonstige methodische Hinweise: Limitations: Most studies assessing the efficacy of treatment for

	hyperkalaemia are of patients with end-stage renal disease, are small and have variable designs. Most studies do not assess the incidence of arrhythmias in clinically significant hyperkalaemia and the evidence for the use of intravenous calcium salts in preventing and treating arrhythmias is limited to case reports and anecdotal evidence. Adverse events, including hypoglycaemia, are not consistently reported.
	Freitext/Empfehlungen/Hinweise 5. Hyperkalaemia (Guidelines Hyperkalaemia 5.1- 5.6) Guideline 5.1 – Hyperkalaemia: Summary of treatment strategy We recommend that the treatment of hyperkalaemia follows a logical 5-step approach. (1B) Guideline 5.2 – Hyperkalaemia: STEP 1 - Protect the heart; intravenous calcium salts We recommend that intravenous calcium chloride or calcium gluconate, at an equivalent dose (6.8mmol), is given to patients with hyperkalaemia in the presence of ECG evidence of hyperkalaemia. (1A) Guideline 5.3.1 – Hyperkalaemia: STEP 2 – Shift K+ into cells; insulin-glucose infusion We recommend that insulin-glucose (10 units soluble insulin in 25g glucose) by intravenous infusion is used to treat severe (K+ ≥ 6.5 mmol/L) hyperkalaemia. (1B) Guideline 5.3.2 – Hyperkalaemia: STEP 2 – Shift K+ into cells; insulin-glucose infusion We suggest that insulin-glucose (10 units soluble insulin in 25g glucose) by intravenous infusion may be used to treat moderate (K+ 6.0-6.4 mmol/L) hyperkalaemia. (2C) Guideline 5.4.1 – Hyperkalaemia: STEP 2 – Shift K+ into cells; salbutamol We recommend nebulised salbutamol 10-20mg is used as adjuvant therapy for severe (K+ ≥ 6.5 mmol/L) hyperkalaemia. (1B) Guideline 5.4.2 – Hyperkalaemia: STEP 2 – Shift K+ into cells; salbutamol We suggest that nebulised salbutamol 10-20mg may be used as adjuvant therapy for moderate (K+ 6.0-6.4 mmol/L) hyperkalaemia. (2C) Guideline 5.4.3 – Hyperkalaemia: STEP 2 – Shift K+ into cells; salbutamol

	We recommend that salbutamol is not used as monotherapy in the treatment of severe hyperkalaemia. (1A) Guideline 5.5 – Hyperkalaemia: STEP 2 – Shift K+ into cells; sodium bicarbonate We suggest that intravenous sodium bicarbonate infusion is not used routinely for the acute treatment of hyperkalaemia. (2C) Guideline 5.6 – Hyperkalaemia: STEP 3 – Remove K+ from body; cation-exchange resins We suggest that cation-exchange resins are not used in the emergency treatment of severe hyperkalaemia, but may be considered in patients with mild to moderate hyperkalaemia. (2B) 6. Blood monitoring (Guidelines 6.1 - 6.3) Guideline 6.1 – Hyperkalaemia: STEP 4 - Blood monitoring; serum K+ We recommend that the serum K+ is monitored closely in all patients with hyperkalaemia to assess efficacy of treatment and look for rebound hyperkalaemia after the initial response to treatment wanes. (1B) Guideline 6.2 – Hyperkalaemia: STEP 4 - Blood monitoring; serum K+ We suggest that serum potassium be assessed at least 1, 2, 4, 6 and 24 hours after identification and treatment of hyperkalaemia. (2C) Guideline 6.3 – Hyperkalaemia: STEP 4 - Blood monitoring; blood glucose We recommend that the blood glucose concentration is monitored at regular intervals (0, 15, 30, 60, 90, 120, 180, 240, 300, 360 minutes) for a minimum of 6 hours after administration of insulin-glucose infusion in all patients with hyperkalaemia. (1C) 7. Referral to Renal Services (Guidelines 7.1 - 7.3) Guideline 7.1 - Hyperkalaemia: Specialist Referral We suggest that patients with severe hyperkalaemia (serum potassium care team for an urgent opinion, guided by the clinical scenario and its persistence after initial medical treatment. (2C) Guideline 7.2 - Hyperkalaemia: Treatment facilities We recommend that patients with severe hyperkalaemia and problems with airway, breathing and/ or circulation (ABC), be referred to the local ICU team in the first instance. (1C)

	Guideline 7.3 - Hyperkalaemia: Treatment facilities We recommend that stable patients with severe hyperkalaemia be admitted to an area with facilities for cardiac monitoring, ideally in a renal unit, coronary care unit, HDU or ICU depending on local facilities or practice. (2C) 8. Minimum standards for patient transfer (Guidelines 8.1 - 8.2) Guideline 8.1 - Hyperkalaemia: Transfer to renal services We suggest that transfer to renal services be considered in clinically stable patients in whom hyperkalaemia cannot be controlled (i.e. serum K <6.5 mmol/L) using medical measures particularly in the presence of advanced or oliguric renal failure (either AKI or CKD). (2C) Guideline 8.2 - Hyperkalaemia: Minimum standards for safe patient transfer We suggest that inter- or intra-hospital patient transfer be coordinated by senior clinicians and follows national guidelines. (2B) 9. Indications for escalation of care (Guidelines 9.1-9.5) Guideline 9.1 – Hyperkalaemia: Escalation of care We recommend that patients with hyperkalaemia are managed in an area appropriate to their level of clinical need (Level of care 1, 2 or 3). (1B) Guideline 9.2 – Hyperkalaemia: Escalation of care We recommend escalation of care, where appropriate, in all patients with problems with airway, breathing, circulation and/ or disability. (1B) Guideline 9.3 – Hyperkalaemia: Escalation of care – Procedure for referral We recommend that patients are referred to the ICU team by a senior member of the referring team if escalation of care is required from the outset or if the patient fails to respond to initial treatment. (1B) Guideline 9.4 – Hyperkalaemia: Escalation of care – Need for RRT and other organ support We recommend escalation of care in patients with hyperkalaemia requiring renal replacement therapy in addition to other organ support (e.g. ventilation or circulation). (1B) Guideline 9.5 – Hyperkalaemia: Escalation of care – Method of RRT

	in ICU We suggest that the decision to initiate RRT for patients with hyperkalaemia in the ICU and the chosen modality take into account local practice and dialysis facilities. (2C) 10. Hyperkalaemic cardiac arrest (Guidelines 10.1-10.2) Guideline 10.1 – Hyperkalaemia; Cardiac Arrest; special consideration We recommend that hyperkalaemia is considered in all patients who have a cardiac arrest as part of identifying and treating a reversible cause using the '4 Hs and 4 Ts' approach. (1A) Guideline 10.2 – Hyperkalaemia; Cardiac Arrest; dialysis during CPR We suggest that dialysis is considered for hyperkalaemic cardiac arrest if hyperkalaemia is resistant to medical therapy. (2C) 11. Hyperkalaemia Treatment Algorithms (Guidelines 11.1-11.2) Guideline 11.1 – Hyperkalaemia; Treatment Algorithm We recommend a standardised approach to the management of patients with hyperkalaemia using the aid of a treatment algorithm (Appendix 4). (1B) Guideline 11.2 – Hyperkalaemia; Treatment Algorithm in cardiac arrest We suggest a standardised approach to the management of patients with hyperkalaemic cardiac arrest using the aid of a treatment algorithm (Appendix 6). (2C) 12. Treatment in Primary Care (Guidelines 12.1-12.6) Guideline 12.1 – Hyperkalaemia: Treatment in Primary Care; hospital referral We recommend that all patients with severe hyperkalaemia (K+ ≥ 6.5 mmol/L) are referred to secondary care for immediate assessment and treatment. (1B) Guideline 12.2 – Hyperkalaemia: Treatment in Primary Care; prevention We recommend that all patients with mild (K+ ≥ 5.5-5.9 mmol/L) or moderate (K+ 6.0-6.4 mmol/L) hyperkalaemia have a review of their medication and diet and regular monitoring of serum potassium; the urgency of assessment and frequency of potassium monitoring will

	depend on individual circumstances. (1B) Guideline 12.3 – Hyperkalaemia: Treatment in Primary Care; prevention We suggest that renin-angiotensin drugs (ACE-inhibitors, angiotensin II receptor blockers, aliskiren), potassium sparing diuretics, and/ or loop diuretics are stopped during acute illness lasting > 24 hours duration particularly when associated with hypovolaemia or hypotension (e.g. sepsis, diarrhoea and/or vomiting). (1C) Guideline 12.4 – Hyperkalaemia: Treatment in Primary Care; monitoring We suggest that renal function is assessed before commencing treatment with drugs that can cause hyperkalaemia and thereafter, renal function and serum potassium be monitored in the community after initiation, after dose adjustments and during acute illness. (2C) Guideline 12.5 – Hyperkalaemia: Treatment in Primary Care; prescribing We suggest that non-steroidal anti-inflammatory drugs or trimethoprim, particularly in combination with renin-angiotensin blockade, are avoided in the patients with CKD 4 and 5, and care should also be taken in the elderly. (2B) Guideline 12.6 – Hyperkalaemia: Treatment in Primary Care; pseudo-hyperkalaemia We suggest that patients in the community with suspected pseudohyperkalaemia are referred to hospital for verification of hyperkalaemia and appropriate treatment if necessary. (2B) 13. Drug administration and patient safety (Guideline 13.1) Guideline 13.1 – Hyperkalaemia: Drug safety We recommend that hospitals adopt standard regimens for drug administration and monitoring in the treatment of hyperkalaemia to reduce adverse events. (1B)

Detaillierte Darstellung der Recherchestrategie

Cochrane Library (Cochrane Database of Systematic Reviews, Health Technology Assessment Database) **am 14.06.2016**

#	Suchfrage
1	MeSH descriptor: [Hyperkalemia] explode all trees
2	(hyperkalemia* or hyperkalaemia* or hyperpotassemia* or hyperpotassaemia*):ti,ab,kw (Word variations have been searched)
3	#1 or #2
4	#1 or #2 Publication Year from 2011 to 2016, in Cochrane Reviews (Reviews only) and Technology Assessments

SR, HTAs in Medline (PubMed) am 14.06.2016

#	Suchfrage
1	hyperkalemia[MeSH Terms]
2	(((hyperkalemia*[Title/Abstract]) OR hyperkalaemia*[Title/Abstract]) OR hyperpotassemia*[Title/Abstract]) OR hyperpotassaemia*[Title/Abstract]
3	(#1) OR #2
4	(Meta-Analysis[ptyp] OR systematic[sb] OR Technical Report[ptyp])
5	(((((trials[Title/Abstract] OR studies[Title/Abstract] OR database*[Title/Abstract] OR literature[Title/Abstract] OR publication*[Title/Abstract] OR Medline[Title/Abstract] OR Embase[Title/Abstract] OR Cochrane[Title/Abstract] OR Pubmed[Title/Abstract])) AND systematic*[Title/Abstract] AND (search*[Title/Abstract] OR research*[Title/Abstract]))) OR ((((((((((HTA[Title/Abstract]) OR technology assessment*[Title/Abstract]) OR technology report*[Title/Abstract]) OR (systematic*[Title/Abstract] AND review*[Title/Abstract])) OR (systematic*[Title/Abstract] AND overview*[Title/Abstract])) OR meta-analy*[Title/Abstract]) OR (meta[Title/Abstract] AND analyz*[Title/Abstract])) OR (meta[Title/Abstract] AND analys*[Title/Abstract])) OR (meta[Title/Abstract] AND analyt*[Title/Abstract]))) OR (((review*[Title/Abstract]) OR overview*[Title/Abstract]) AND ((evidence[Title/Abstract]) AND based[Title/Abstract]))))
6	(#4) OR #5
7	(#3) AND #6
8	(#7) AND ("2011/06/01"[PDAT] : "2016/06/14"[PDAT])

Leitlinien in Medline (PubMed) am 14.06.2016

#	Suchfrage
1	hyperkalemia[MeSH Terms]
2	(((hyperkalemia*[Title/Abstract]) OR hyperkalaemia*[Title/Abstract]) OR hyperpotassemia*[Title/Abstract]) OR hyperpotassaemia*[Title/Abstract]
3	(#1) OR #2
4	(((((Guideline[Publication Type]) OR Practice Guideline[Publication Type]) OR Consensus Development Conference[Publication Type]) OR Consensus Development Conference, NIH[Publication Type]) OR guideline*[Title]) OR recommendation*[Title]

5	(#3) AND #4
6	(#5) AND ("2011/06/01"[PDAT] : "2016/06/14"[PDAT])

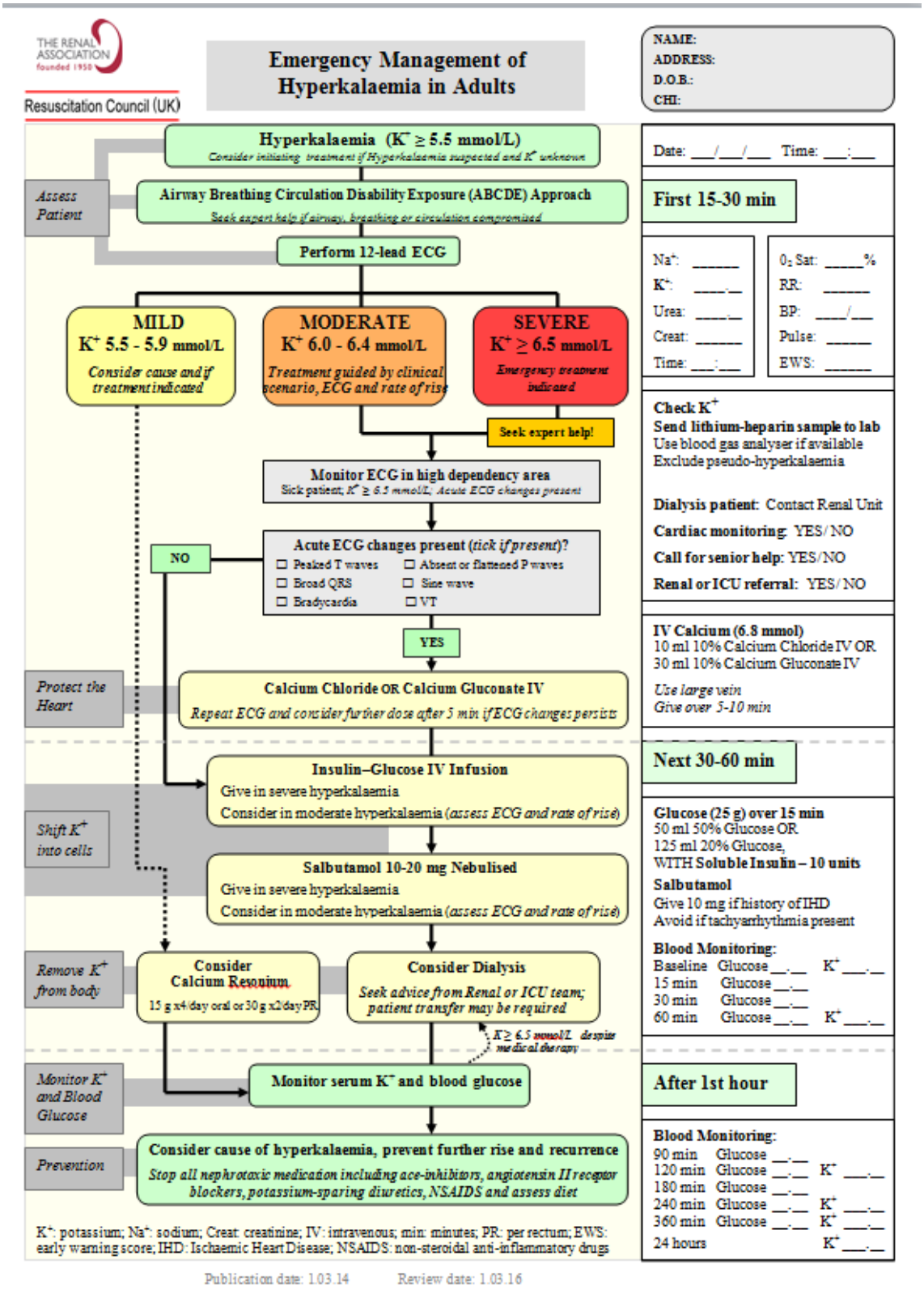
Literatur:

1. **Batterink J, Cessford TA, Taylor RA.** Pharmacological interventions for the acute management of hyperkalaemia in adults. Cochrane Database of Systematic Reviews [online]. 2015; (10):Cd010344. URL: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD010344.pub2/abstract.

2. **UK Renal Association.** Clinical practice guideline treatment of acute hyperkalaemia in adults [online]. Petersfield (GBR): UK Renal Association; 2014. [Zugriff: 13.06.2016]. URL: http://www.renal.org/docs/default-source/guidelines-resources/joint-guidelines/treatment-of-acute-hyperkalaemia-in-adults/hyperkalaemia-guideline---march-2014.pdf?sfvrsn=2.

Anhang:

UK Renal Association 2014 [2]. Clinical practice guideline treatment of acute hyperkalaemia in adults



Treatment of Hyperkalaemic Cardiac Arrest

THE RENAL ASSOCIATION founded 1950

Resuscitation Council (UK)

NAME
ADDRESS:
D.O.B.:
CHI:

Follow ALS Algorithm

Identify and treat reversible causes
Treat hyperkalaemia

Seek expert help!

Hyperkalaemia ($K^+ \geq 6.5$ mmol/L)

Protect the Heart — **Calcium Chloride OR Calcium Gluconate IV bolus**
Consider repeating dose if ROSC not achieved within 5-10 min, or if resuscitation attempt is prolonged

Shift K^+ into cells — **Insulin – Glucose IV bolus**

Treat metabolic acidosis — **Sodium Bicarbonate IV bolus**

Remove K^+ from body — **Consider Dialysis during CPR if no ROSC**
(HD or HDF more efficient than CVVH or PD)

Monitor K^+ and Glucose — **Monitor serum K^+ and blood glucose**

Post-Arrest — **ROSC achieved**
Follow standard post cardiac arrest management and treatment of hyperkalaemia

Prevention — **Consider cause of hyperkalaemia and prevent recurrence**

K^+: potassium; Na^+: sodium; Creat: creatinine; Bicarb: bicarbonate; IV: intravenous; min: minutes; CPR: cardiopulmonary resuscitation; ROSC: return of spontaneous circulation; HD: haemodialysis; HDF: haemodiafiltration; PD: peritoneal dialysis; CVVH: continuous veno-venous haemofiltration.

Date: ___/___/____ Time: ____:____

First 15 min

Na^+: _____	pH ___.___
K^+: ___.__	pCO_2 ___.__
Urea: ___.__	pO_2: ___.__
Creat: _____	Bicarb : _____
Time: ___:___	BE: _____

Dialysis patient: Contact Renal Unit

IV Calcium (6.8 mmol)
10 ml 10% Calcium Chloride IV OR
30 ml 10% Calcium Gluconate IV

Effective within 3-5 min, but effect lasts only 30-60 min
Give empirically if suspected hyperkalaemia (e.g. for dialysis patient)

Glucose (25 g)
50 ml 50% Glucose OR
125 ml 20% Glucose,
WITH **Soluble Insulin – 10 units**

Sodium Bicarbonate
50 ml 8.4% (50 mmol)
No evidence for potassium lowering but effect of hyperkalaemia exacerbated by metabolic acidosis

15 min onwards

Dialysis

Plan early

Use existing dialysis access if available, otherwise insert femoral vein catheter

Use dialysate solutions containing no potassium, or low potassium concentration

Blood Monitoring:

	Glucose	K^+
Baseline	___.__	___.__
15 min	___.__	___.__
30 min	___.__	___.__
60 min	___.__	___.__
90 min	___.__	___.__
120 min	___.__	___.__
180 min	___.__	___.__
240 min	___.__	___.__
360 min	___.__	___.__

Publication Date: 1.03.14 Review Date: 1.03.16