

Załącznik nr 1. Zestawienie badań porównujących HD i HDF w przeglądzie systematycznym Cochrane**Tabela 1 Zestawienie badań porównujących HD i HDF na podstawie przeglądu systematycznego Cochrane**

Badanie	Populacja	Interwencja
Altieri 2004	ESKD patients on dialysis for at least 6 months and were in stable clinical condition Exclusion criteria: daily diuresis of more than 200 mL; presence of chronic infection, malignancy, systemic disease, liver insufficiency or active liver illness; overt malnutrition; clinically evident cardiac dysfunction; serious endocrine dysfunction; overt peripheral vascular disease; malfunction of vascular access; body weight exceeding 75 kg	HF with high-flux polyflux 21S filter ◦ QB: 300 mL/min Vs HDF with high-flux polyflux 14S filters ◦ QB: 300 mL/min ◦ QD: 500 mL/min
Bammens 2004	Stable chronic HD patients ◦ Mean time on dialysis: 24.8 months Exclusion criteria: not stated	Treatment group 1 • HDF with replacement solution at 40, 60, 80 and 100 mL/min in a post-dilution mode Treatment group 2 • HDF with replacement solution at 80 mL/min in pre-dilution mode Both treatment groups • Duration of each session: 4 hours • Dialyser: Fresenius F80 • QD: 600 mL/min • QB: 300 mL/min • HDF with replacement solution at 120 mL/min in post-dilution mode, with a QB of 350 mL/min and an QD of 800 mL/min was also studied in 6 patients, 2 sessions each Control group • HD high-flux ◦ Duration of each session: 4 hours ◦ Dialyser: Fresenius F80 ◦ QD: 600 mL/min ◦ QB: 300 mL/min • HD with a QB of 350 mL/min and an QD of 800 mL/min was also studied in 6 patients, 2 sessions each
Beerenhout 2005	Chronic HD patients on dialysis for at least 3 months and with adequate arteriovenous access Exclusion criteria: CV morbidity defined as ejection fraction < 25% and/or coronary heart disease (NYHA Class 3-4); severe intercurrent illness Exclusion criteria: CV morbidity defined as ejection fraction < 25% and/or	Treatment group • HF with high-flux polyamide (Polyflux 24S) dialysers Control group • HD with low-flux polyamide (Polyflux 8S) dialysers

Badanie	Populacja	Interwencja
	coronary heart disease (NYHA Class 3-4); severe intercurrent illness	
Bolasco 2003	<p>Chronic HD patients on dialysis for at least 6 months; aged 18 to 80 years; thriceweekly HD or HDF; body weight \leq 90 kg</p> <p>Exclusion criteria: malignancies, active systemic disease, active hepatitis or cirrhosis, instable diabetes, diuresis >200 mL/24 h, dysfunction of vascular access, with blood flow rate < 300 mL/min; clinically relevant infections, active systemic diseases</p>	<p>Treatment group 1</p> <ul style="list-style-type: none"> • HF with high-flux polyamide dialysers <ul style="list-style-type: none"> ◦ Infusate/blood flow ratio of 0.6 ◦ Dialysate infusate rate of 700 mL/min <p>Treatment group 2</p> <ul style="list-style-type: none"> • HDF with high-flux polyamide dialysers <ul style="list-style-type: none"> ◦ Infusate/blood flow ratio of 0.6 ◦ Dialysate infusate rate of 700 mL/min <p>Control group</p> <ul style="list-style-type: none"> • HD with low-flux dialysers <ul style="list-style-type: none"> ◦ Dialysate flow rate of 500 mL/min
Coll 2009	Chronic HD patients on dialysis for at least 3 months; age > 18 years; thriceweekly HD; stable regimen of anticoagulation and EPO; HCT $> 28\%$; blood flow rate > 250 mL/min	<p>Predilution HDF acetate-free dialysate for 6 months, 3 to 4 hours, 3 times/week (611 free-acetate, Bellco, Mirandola, Italy)</p> <p>Control group</p> <ul style="list-style-type: none"> • Predilution HDF with conventional bicarbonate dialysate for 6 months, 3 to 4 hours 3 times/week (Formula dialysis machine, Bellco, Mirandola, Italy)
CONTRAST (Dutch) Study 2005	<p>Patients treated by HD 2 or 3 times/week, for at least 2 months; able to understand the study procedures; willing to provide written informed consent</p> <ul style="list-style-type: none"> ◦ Mean time on dialysis: treatment group (2.8 ± 2.9); control group (3.0 ± 2.8) ◦ Diabetes: treatment group (26%); control group (22%) 	<p>Treatment group</p> <ul style="list-style-type: none"> • Post-dilution on-line HDF; 2 or 3 times/week, target convection volume 6 L/h <p>Control group</p> <ul style="list-style-type: none"> • Low-flux HD 2 or 3 times/week <p>Both groups</p> <ul style="list-style-type: none"> • Only biocompatible synthetic dialysers were used (Gambro or Fresenius products)
Cristofano 2004	<ul style="list-style-type: none"> • Chronic stable HD patients 	<p>Treatment group</p> <ul style="list-style-type: none"> • HDF <p>Control group</p> <ul style="list-style-type: none"> • Low-flux HD
ESHOL Study 2011	<ul style="list-style-type: none"> • Patients aged ≥ 18 years; currently undergoing HD; clinical stability; stable vascular access 	<p>Treatment group</p> <ul style="list-style-type: none"> • Post-dilution on-line HDF 3 times/week <p>Control group</p> <ul style="list-style-type: none"> • HD 3 times/week <p>Both groups</p> <ul style="list-style-type: none"> • The length of dialysis sessions in each treatment modality was not modified • For patients on post-dilution HDF, a minimum of 18 L/session replacement volume was requested

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Kantartzi 2013	Age > 18 years, regular (for at least 3 months) HD 3 times/week	Treatment group 1 • On-line high-flux HDF Treatment group 2 • High-flux HDF with prepared bags of substitution (HDF) Control group • Low-flux conventional HD
Karamperis 2005	aged > 18 years; stable without severe clinical symptoms of heart failure (NYHA 0 - II); regular (for at least 3 months) HD, HDF or HF 3 times/week; possibility to ultrafiltrate approximately 3% of the body weight during dialysis; HCT > 30% and stable arterio-venous fistula	Treatment group • On-line predilution HDF for one dialysis session, 4.5 hours/session (Fresenius 4008H dialysis console with high-flux HDF100 S filters) Control group • Low-flux conventional HD for one dialysis session, 4.5 hours/session (Fresenius 4008H dialysis console with low-flux F8 HPS filters)
Lin 2001	Chronic stable and anuric ESKD patients on HD for more than 6 months	Treatment group • On line HDF, 3 times/week with high-flux F-80 polysulfone dialyser ◦ QB: > 250 mL/min ◦ QD: 500 mL/min Control group • High-flux HD 3 times/week with polysulfone F80 dialysers ◦ QB: > 250 mL/min ◦ QD: 500 mL/min Co-interventions: not stated
Locatelli 1994	Aged 18 to 70 years; RRT for at least 2 months; on dialysis for > 3 months; regular HD 3 times/week; stable clinical condition	Treatment group 1 • Low-flux HD with cuprophane membranes Treatment group 2 • Low-flux HD with polysulfone membrane Treatment group 3 • High-flux HD with polysulfone membrane Treatment group 4 • High-flux HDF with polysulfone membrane Co-interventions: not stated
Lornoy 1998	Chronic anuric HD patients ◦ Mean time on dialysis: 6.9 years	Treatment group 1 • HDF with replacement solution at 40, 60, 80 and 100 mL/min in a post-dilution mode Treatment group 2 • HDF with replacement solution at 80 mL/min in pre-dilution mode Control group • HD ◦ Duration of each session: 4 hours ◦ Dialyser: Fresenius F80 ◦ QD: 600 mL/min ◦ QB: 300 mL/min Co-interventions: not stated

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Mandolfo 2008	Chronic HD patients on dialysis for at least 12 months; clinically stable; vascular access with blood flow rate < 300 mL/min (inadequate vascular access)	Treatment group <ul style="list-style-type: none"> • Mid-dilution HDF i) Dialysis machine Formula 2000 (Bellco, Italy) ii) High-flux filters Nephros OL-pure MD190 Control group <ul style="list-style-type: none"> • High-flux HD i) Dialysis machine Formula 2000 (Bellco, Italy) ii) High-flux filters DIAPES BLS 819G
Ohtake 2012	<ul style="list-style-type: none"> • Country: Japan • Setting: single centre • CKD stage 5; aged 18 to 80 years; on dialysis < 6 months ◦ Mean time on dialysis (months): treatment group (64.5 ± 38.2); control group (58.8 ± 64.4) • Number: treatment group (13); control group (9) • Mean age ± SD (years): treatment group (58.6 ± 11.3); control group (62.4 ± 7.7) • Sex (M/F): 15/7 • Exclusion criteria: acute infection or hospitalizations within 4 weeks before study entry; functional failure of arteriovenous fistula with less than 5 mL/kg/min or more blood flow; malignancy, pregnancy, severely suppressed cardiac function (EF < 40%) and/or severe arrhythmia, and dialysis difficulty due to unstable intradialytic blood pressure status. 	Treatment group <ul style="list-style-type: none"> • On-line, predilution HDF ◦ High-flux/Polyflux H membrane, treatments performed with the APSEx, Asahi Kasei Kuraray Medical Co. Ltd, Tokyo, Japan Control group <ul style="list-style-type: none"> • High-flux HD • High-flux/Polyflux H membrane, treatments performed with the APSEx, Asahi Kasei Kuraray Medical Co. Ltd, Tokyo, Japan
Pedrini 2011a	Country: Italy <ul style="list-style-type: none"> • Setting: multi-centre (8) • Patients aged 18 to 80 years; stable HD treatment 3 times/week for at least 3 months and native or prosthetic arteriovenous fistula with an effective blood flow > 300 mL/min ◦ Mean time on dialysis: 7.4 ± 7.1 years • Number (enrolled/randomised/analysed): 69/62/62 • Mean age ± SD: 59.6 ± 12.9 years • Sex (M/F): 48/25 • Exclusion criteria: malignancy with poor prognosis; congestive heart failure; acute myocardial infarction or stroke in the last 3 months; diabetes or lipid disorders treated 	Treatment group <ul style="list-style-type: none"> • On-line HDF, 3 sessions/week ◦ Mean blood flow: 348 ± 38 mL/min ◦ Session length: 228 ± 22 min Control group <ul style="list-style-type: none"> • Low-flux HD, 3 sessions/week ◦ Mean blood flow: 348 ± 38 mL/min Session length: 228 ± 22 min

Badanie	Populacja	Interwencja
	pharmacologically	
Righetti 2010	<p>Country: Italy</p> <ul style="list-style-type: none"> • Setting: multi-centre (2) • Chronic HD patients, at least 2 months on dialysis, on a regular treatment with ESA (alpha epoetin), iron gluconate and vitamin B <ul style="list-style-type: none"> ◦ Mean time on dialysis: 48.7 ± 9.9 months • Number: 24 • Mean age \pm SD: 61.4 ± 2.9 years • Sex (M/F): 16/8 • Exclusion criteria: patients with residual renal function; severe CV disease (left ventricular ejection fraction less than 30% and/or a NYHA heart disease classification of III-IV); malignancy; basal albumin < 4 mg/dl. 	<p>Treatment group</p> <ul style="list-style-type: none"> • Internal HDF, high-flux membrane TS1.8UL (Toraysulfone), treatments performed with the AK 200/200-S ULTRA (Gambro), 3 sessions/week, <ul style="list-style-type: none"> ◦ Mean blood flow: 326 ± 3 mL/min ◦ Session length: 228 ± 22 min ◦ Ultrafiltration volume: about 14 L/session <p>Control group</p> <ul style="list-style-type: none"> • Low-flux HD, low-flux membrane BLS (Bellco, Italy) and Polyflux L (Gambro, Sweden); treatments performed with the AK 200/200-S ULTRA (Gambro), 3 sessions/week <ul style="list-style-type: none"> ◦ Mean blood flow: 335 ± 2 mL/min ◦ Session length: 228 ± 22 min
Schiffl 2007	<p>Country: Germany</p> <ul style="list-style-type: none"> • Setting: single centre • Clinically stable ESKD patients for at least 6 months; treated thrice weekly with conventional HD, permanent and functional vascular access with a blood flow rate ≥ 250 mL/min <ul style="list-style-type: none"> ◦ Mean time on dialysis: 26 months (9 to 280) • Number: treatment group (38); control group (38) • Mean age \pm SD (years): treatment group (63 ± 9); control group (59 ± 10) • Sex (M/F): treatment group (22/16); control group (20/18) • Exclusion criteria: patients with a malignancy, severe comorbidity (heart failure NYHA class III-IV, liver cirrhosis, chronic inflammatory or infectious diseases, diabetic foot and dementia) 	<p>Treatment group</p> <ul style="list-style-type: none"> • On-line HDF, 3 times/week, 4 to 5 hours (mean 254 ± 25 min); polysulfone F80 (Fresenius), MTS 4008 H (Fresenius) <ul style="list-style-type: none"> ◦ Blood flow rate range: 250 to 350 mL/min ◦ Volume of substitution fluid 4.5L/h <p>Control group</p> <ul style="list-style-type: none"> • Ultrapure high-flux HD, 3 times/week, 4 to 5 hours (mean 254 ± 25 min), highflux polysulfone F60 (Fresenius), MTS 4008, Fresenius <ul style="list-style-type: none"> ◦ Blood flow rate range: 250 to 350 mL/min ◦ Ultrapure dialysis fluid produced with an endotoxin absorbing membrane (Diasafe, Fresenius Medical Care)

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Selby 2006a	<ul style="list-style-type: none"> Country: UK Setting: single centre Chronic HD patients hypotension-prone (6 patients) or stable on HD <ul style="list-style-type: none"> Mean time on dialysis: 39.5 ± 18.7 months Number: 12 Mean age \pm SD: 68 ± 11.2 years Sex (M/F): 10/2 Exclusion criteria: Hb < 10 g/dL, or if they had significant comorbidity that, in the opinion of the investigator, would make completion of the study unlikely 	<p>Treatment group</p> <ul style="list-style-type: none"> Acetate-free HDF <ul style="list-style-type: none"> Dialysis machine Formula 2000 (Bellco, Italy) "Diapes polyether sulphone double chamber dialyzers consisting of a combined 1.9 m2 dialyzer and 0.7 m2 ultrafilter (Bellco, Mirandola, Italy) <p>Control group</p> <ul style="list-style-type: none"> Low-flux standard HD <ul style="list-style-type: none"> Dialysis machine Formula 2000 (Bellco, Italy) Low-flux filters LOPS 18/20 (Braun Medical Ltd., UK)
Stefansson 2012	<ul style="list-style-type: none"> Country: Sweden Setting: single centre Chronic HD patients on dialysis for at least 3 months, >18 years, either on HD or HDF Number: 20 Mean age \pm SD: 60 ± 13.6 years Sex (M/F): 14/6 Exclusion criteria: not in stable condition, with any signs of acute inflammation, infection or CV disease 	<p>Treatment group</p> <ul style="list-style-type: none"> HDF in on-line post-dilution mode with AK 200 Ultra dialysis machines (Gambro, Lund, Sweden) <p>Control group</p> <ul style="list-style-type: none"> Low-flux HD with Polyflux 17 L filters and AK 200 Ultra dialysis machines (Gambro, Lund, Sweden)
Tuccillo 2002	<ul style="list-style-type: none"> Country: Italy Setting: single centre Diuresis < 200 mL during interdialysis period; clinically stable; permanent vascular access; no diabetes, liver cirrhosis or oedema Number: 12 Sex (M/F): 7/5 Mean age \pm SD: 53 ± 4 years Exclusion criteria: not stated 	<p>Treatment group</p> <ul style="list-style-type: none"> HDF with polysulfone Fresenius F8 1.8 m2 dialysis membrane, PMMA Filter B3-2, 2 m2 <ul style="list-style-type: none"> Duration: 1 session in the acute phase, 3 months in the chronic phase QB: 315 to 345 mL/min QD: 500 mL/min <p>Control group</p> <ul style="list-style-type: none"> HD with polysulfone Fresenius F8 1.8 m2 dialysis membrane, PMMA Filters B3-2, m2 <ul style="list-style-type: none"> Duration: 1 session in the acute phase, 3 months in the chronic phase QB: 315 to 345 mL/min QD: 500 mL/min <p>Co-interventions: not stated</p>
TURKISH HDF 2013	<ul style="list-style-type: none"> Country: Turkey Setting: multi-centre (10) Aged > 18 years on maintenance bicarbonate HD scheduled thrice weekly 12 h/week, achieved mean single pool Kt/V above 1.2; willingness to participate in the study with a written informed consent <ul style="list-style-type: none"> Mean time on dialysis: 57.9 ± 13.9 months Diabetes: 34.7% Number: treatment group (391); control group (391) 	<p>Treatment group</p> <ul style="list-style-type: none"> Post-dilution on-line HDF, 3 times/week, 4 hours; FX series high-flux helixone membranes used; ONLINEplus integrated Fresenius 4008S machines <ul style="list-style-type: none"> Duration of each session: 240 minutes Blood flow rates: 250 to 400 mL/min Substitution volume > 15 L <p>Control group</p> <ul style="list-style-type: none"> High-flux HD, 3 times/week, 4 hours; FX series high-flux helixone membranes used <ul style="list-style-type: none"> Duration of each session: 240 minutes Blood flow rates: 250 to 400 mL/min

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	<ul style="list-style-type: none"> • Mean age \pm SD (years): treatment group (56.4 ± 13.0); control group (56.5 ± 14.9) • Sex (F): treatment group (40.4%); control group (41.9%) • Exclusion criteria: scheduled for living donor renal transplantation; serious lifelimiting co-morbid situations, namely active malignancy, active infection, end-stage cardiac, pulmonary, or hepatic disease; pregnancy or lactating; Current requirement for HD more than 3 times/week due to medical comorbidity; GFR > 10 mL/min/1.73 m² as measured by the average of urea and CrCl obtained from a urine collection of at least 24 hours; use of temporary catheter; insufficient vascular access (blood flow rate < 250 mL/min); urine output > 250 mL/d; mental incompetence 	
Vaslaki 2006	<ul style="list-style-type: none"> • Country: Hungary • Setting: multi-centre (7) • Chronic adult HD patients on dialysis for at least 3 months • Number: 129 • Mean age \pm SD: 62.3 ± 12.4 years • Sex (M/F): 24/46 • Exclusion criteria: pregnancy; lactation; infectious disease; simultaneous participation in another clinical study 	<p>Treatment group</p> <ul style="list-style-type: none"> • On-line HDF; high-flux polysulfone dialysers, 4008 HD machines form Fresenius Medical Care ◦ Mean volume of substitution fluid: 20.3 ± 3.0 L <p>Control group</p> <ul style="list-style-type: none"> • Low-flux HD; polysulfone dialysers, HPS series and 4008 HD machines, Fresenius Medical Care
Ward 2000	<ul style="list-style-type: none"> • Country: Germany • Setting: single centre • Stable chronic HD patients on dialysis for at least 2 months; permanent dialysis access capable of delivering a blood flow rate of at least 250 mL/min • Number: treatment group (24); control group (21) • Mean age \pm SD (years): treatment group (61 ± 3); control group (52 ± 3) • Sex (M/F): treatment group (15/9); control group (14/7) • Exclusion criteria: not stated 	<p>Treatment group</p> <ul style="list-style-type: none"> • HDF with high-flux polyamide membrane for 12 months ◦ Substitution solution infusion rates: 65 to 85 mL/min <p>Control group</p> <ul style="list-style-type: none"> • HD with high-flux polyamide membrane for 12 months ◦ QD: 500 mL/min <p>Co-interventions: not stated</p>

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Wizemann 2000	<ul style="list-style-type: none"> Country: Germany Setting: single centre Chronic HD patients on dialysis with low-flux HD for at least 3 months Number: treatment group (23); control group (21) Mean age \pm SD (years): treatment group (61 ± 12); control group (60 ± 11) Sex (M/F): treatment group (12/11); control group (13/8) Exclusion criteria: not stated 	<p>Treatment group</p> <ul style="list-style-type: none"> HDF with high-flux polysulfone (Fresenius F-80S) membranes for 24 months <ul style="list-style-type: none"> QD: 100 to 200 mL/min Duration of each dialysis session: 4.5 hours Total substitution fluid volume was targeted to 60 L/session <p>Control group</p> <ul style="list-style-type: none"> HD with low-flux polysulfone (Fresenius F8) membranes for 24 months <ul style="list-style-type: none"> QB: 400 to 500 mL/min QD: 500 mL/min Dialysis duration: 4.5 hours <p>Co-interventions: not stated</p>

Źródło: Nistor, Palmer i Craig, 2015