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Supplementary Appendix: Global Register of Commercial and Clinically Used Hyaluronic Acid Products

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Introduction

S1. Purpose and scope

This appendix is the product-literacy companion to the main review. It registers 149 named hyaluronic acid (HA) products, product families and presentations that the main article's tables do not cover in full, across fifteen application categories, from intra-articular viscosupplementation and aesthetic injectables to ophthalmic viscosurgical devices, wound care, urology, gynaecology, bulking agents, adhesion barriers, ear-nose-and-throat and dental products, and cartilage-repair scaffolds.

Its purpose is descriptive and comparative, not promotional. Brand names appear so that clinicians, reviewers and regulators can identify what was actually studied, at what concentration, molecular weight, architecture and dose, in which jurisdiction, at what price, and on what strength of human evidence. No product listed here is endorsed, and no listing implies that a product is interchangeable with any other.

S2. How to read these tables

Every substantive cell carries a hyperlink to the exact primary document that states the value — a regulator record (premarket-approval summary of safety and effectiveness data, 510(k) summary, recall record), a manufacturer instruction for use, summary of product characteristics or European Union summary of safety and clinical performance, an official reimbursement file, or a peer-reviewed publication. Where a field could not be confirmed from such a document it is entered as n.a. and was not inferred, estimated or carried over from a comparable product.

Column key: Conc/dose = concentration and total HA per unit. MW = average molecular weight as disclosed. Evidence = the strongest product-specific human evidence identified, with level: I = randomised controlled trial or meta-analysis of randomised trials; II = comparative or prospective controlled study; III = observational study or case series; IV = laboratory, bench or regulatory data only. Cells describing "class-level" or "platform" evidence indicate that the cited data belong to a related product of the same platform, not to the presentation named in that row.

Price taxonomy: All prices are in United States dollars with the type, unit, pack size, geography and date stated:

- **[ASP]:** official payer payment limit or reimbursement basic price (United States Medicare Part B payment-limit file; United Kingdom NHS Drug Tariff Part IX basic price). A reimbursement limit is not an acquisition price.
- **[ASP-calc]:** a course cost calculated from a payment limit and the labelled regimen.
- **[DIST]:** distributor or wholesale list, sale or outlet price.
- **[CASH]:** consumer retail, pharmacy or discount-card price.
- **[PATIENT]:** patient-facing, direct-pay or clinic-aggregated average price.

Prices of different types are not comparable with one another, move continuously, and are not evidence of comparative clinical effectiveness. Amounts originally quoted in euro or pound sterling were converted at European Central Bank reference rates for 8 September 2026 (1 EUR = 1.1614 USD; 1 GBP = 1.35456 USD, derived from the published EUR/GBP rate of 0.85740), with the original currency and rate date retained in the cell.

S3. Evidence-integrity classification

Each row is classified by what its evidence supports, using four mutually exclusive labels:

Label	Meaning	What the label permits	What it forbids
PU — Platform utility	Mechanical, rheological, barrier, lubricating, space-maintaining, bulking or carrier function, sometimes with randomised evidence for a clinical outcome	Statements about the physical or protective function achieved, and about clinical endpoints actually measured	Any implication of tissue regeneration, cartilage restoration or disease modification
SV — Symptomatic / viscosupplementation	Pain or function improvement over weeks to months, product-specific were stated	Symptomatic benefit for the specific product, site and regimen studied	Structural or chondroprotective claims; extrapolation of one brand's trial to another brand

VB — Volumisation / biostimulation	Volume, contour, wrinkle-severity, hydration or skin-quality improvement on validated aesthetic scales	Correction and duration as measured on the stated scale	Neocollagenesis, dermal "regeneration" or bone mimicry as demonstrated human structural restoration
DR — Demonstrated regeneration	Durable, controlled restoration of tissue architecture and function in humans	—	—

No product in this appendix qualifies for the DR label: The three closest candidates are cartilage-repair scaffolds (Appendix Table S15): for the most widely marketed device the comparative evidence is non-randomised and the pivotal randomised trial is reported as mixed; for the second the randomised trial has 24 participants and a composite polyglycolic-acid/hyaluronan scaffold, so HA-specific attribution is impossible; and for the third the United States regulator's own review states that evidence was lacking. Demonstrated regeneration is therefore recorded as unestablished for every product listed here, including products marketed with regenerative or biostimulatory language.

One finding deserves emphasis because it tests the biostimulation claim directly: the only study in this register that measured a genuine structural endpoint after intramucosal injection of a cross-linked HA marketed for bio-stimulation found total vaginal mucosal thickness unchanged (213.65 versus 212.33; $p = 0.5949$) (Appendix Table S10).

S4. Product register by application category

Fifteen tables follow, in the order below. Row counts are the number of products, product-family or presentation entries in each table; a single row may cover several named presentations of one platform where the primary document treats them together.

Appendix table	Application category	Rows
S1	Intra-articular viscosupplements for large joints	41
S2	Small-joint, temporomandibular, post-arthroscopy and tendon or soft-tissue products	7
S3	Aesthetic injectables newly approved in the United States (2021–2026)	8
S4	Aesthetic fillers marketed outside the United States	26
S5	Skin boosters, bioremodelling and hybrid injectables	4
S6	Ophthalmic viscosurgical devices	19
S7	Topical ophthalmic products: tear substitutes and eye ointments	13
S8	Wound care and dermatological topical products	6
S9	Urology: intravesical instillations	6
S10	Gynaecology, vulvovaginal health and intrauterine adhesion prevention	7
S11	Anorectal and urologic bulking agents	3
S12	Surgical adhesion barriers	2
S13	Ear, nose and throat, sinonasal and middle-ear products	3
S14	Dental and periodontal products	1
S15	Cartilage repair and orthobiologic scaffolds or composites	3
Total		149

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Appendix Table S1. Intra-articular Viscosupplements for large joints

Product/brand	Manufacturer	Geography / regulatory status	HA source	Conc/ dose	Syringe/pack volume	MW	Cross-linking / additives	Labeled indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class
ARTHURUM H 2%	LCA Pharma ceutical S. Chartre France	France (manufacturer); marketed in EU via distributors; CE-marked class III implied by IFU, CE year not stated for H 2%	n.a. (not stated)	2% NaHA, 40 mg/2 mL	2 mL	2400 kDa	Non-cross-linked; no additive stated	Knee/other synovial-joint OA. post-traumatic; 1 injection weekly x 3	Level I (pooled): ARTHURUM group WOMAC A mean difference 25.18 (95% CI 21.02–29.34) at 6 months; strict OMERAC T-OARSI response 68.4% at T3–4 and 76.8% at T6; non-inferior to comparator devices and superior to controls	6.5% minor adverse events in comparative studies; no serious adverse events in the reviewed tolerance population	n.a.	SV; DR unestablished
ARTHURUM visc 75 (ARTHURUM 2.5%)	LCA Pharma ceutical S. Chartre France	France; EU	n.a.	2.5%, 75 mg HA	3 mL	2400 kDa	Non-cross-linked	Knee OA pain; single injection	Level II: ART-ONE 75 open prospective study — strict OMERAC T-OARSI responders 88.6% at T3–4 and 91.2% at T6	Open-label design; minor AE rate reported at family level only	n.a.	SV; DR unestablished

ARTH RUM HCS (HA + chond roitin sulfat e)	LCA S.A., Chartre s. France	France; CE mark 2010	n.a.	20 mg/m L; 40 mg HA + 40 mg chond roitin sulfat e per 2 mL	2 mL; boxes of 1 or 3 syring es	2.8 million Da	Comp onents "not chemi cally modifi ed"; chond roitin sulpha te added	Symptom atic knee OA and painful synovial- joint OA; 3 injections at 1-week intervals	Level II: vs other ARTHRU M devices, WOMAC A differenc e favouring HCS 4.1 (SD 17.4) at T1 (p = 0.045); non- significan t at T3 and T6	Mild pain and/or moderate oedema within 48 h	n.a.	SV; DR unest ablish ed
Coxart hrum	n.a.	Italy (marke ted)	n.a.	2.5%, 75 mg	3 mL	2400 kDa	Non- cross- linked	OA; single injection	None product- specific identified	Contraindic ations: HA hypersensit ivity, joint infection	n.a.	SV (label- level only); DR unest ablish ed
Ferma thron	Hyaltec h Ltd., Livingst on, UK	UK/EU	n.a.	1.0% (10 mg/m L), 20 mg/2 mL	2.0 mL pre- filled glass syring e	1.19– 2.03 million Da	Non- cross- linked ("rand om coils")	Pain/stiff ness of knee, hip, shoulder, ankle in mild– moderate OA; up to 3 or 5 weekly injections	Level IV/broch ure-level only; no product- specific trial numbers on sources examined	Brochure gives generic class-level efficacy claims only	n.a.	SV; DR unest ablish ed
Ferma thron Plus	Hyaltec h Ltd.	UK/EU	n.a.	1.5% (15 mg/m L), 30 mg/2 mL	2.0 mL	2.30– 3.98 million Da (broch ure); 2000 kDa (review)	Non- cross- linked	All joints; 1 injection weekly x 3	Level I (compara tor arm): included in the ARTHRU M meta- analysis "EQUIVAL ENTS" group with 99 patients in the main- criterion populatio n	No product- specific AE rate reported; pooled cross- linked/line ar comparato r AE data only	n.a.	SV; DR unest ablish ed

Ferma thron S	Hyaltec h Ltd.	UK/EU	n.a.	69 mg per syring e	3 mL	Conflic t: not reporte d (review) vs family brochu re describ es non- cross- linked rando m coils with numeri c MW only for Fermat hron/PI us	Confli ct: cross- linked with 1,4- butan ediol diglyci dyl ether ("HAC L") vs broch ure: "rando m coils non cross- linked "	Pain, reduced mobility, OA, post- traumatic ; single injection	None product- specific identified	Cross- linking status disputed between sources — do not report a single value	n.a.	SV; DR unest ablish ed
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Adant / Adant Dispo	<u>Meiji Pharma Spain, S.A., Alcalá de Henare s, Madrid</u>	Spain/EU; also the generic equivalent of Supartz developed as GenVisc 850 in the US	<u>Bacterial fermentation</u>	<u>1% NaHA, 25 mg/2.5 mL</u>	<u>2.5 mL</u>	<u>620–1,170 kDa (Supartz equivalent formulation)</u>	<u>Non-cross-linked linear chain</u>	<u>Knee OA, painful shoulder, grade I–III trapezoidal OA, other synovial joints; 1 injection weekly x 5, one cycle/year</u>	Level I: AMELIA trial (n = 306) — repeated IA-Adant cycles maintained superiority vs placebo; OARSI-2004 responders significantly higher from 14 months (p = 0.030) to 40 months (p = 0.004). Level II vs Monovisc (n = 41): comparable, with superior VAS pain at rest for Adant at 6 months	<u>Transient injection-site pain/swelling; rash, urticaria, pruritus; anaphylactic reactions and shock very rarely; caution in hepatic impairment, elderly, pregnancy</u>	n.a. (no verifiable USD listing)	SV; DR unestablished
Adant Plus	<u>Meiji Pharma Spain, S.A.</u>	Spain/EU	n.a.	<u>2% NaHA, 98 mg per syringe</u>	n.a. (volume not stated)	n.a.	n.a. (not stated)	<u>Knee and other synovial-joint OA; single intra-articular injection, usually one per year</u>	None product-specific identified in the sources examined	<u>Local transient pain, swelling/effusion; hypersensitivity including anaphylactic shock and angioedema; systemic rash, urticaria, pyrexia, headache, cramps</u>	n.a.	SV; DR unestablished

Artz / Artz Dispo / Artzal	<u>Seikaga</u> <u>ku</u> <u>Corpor</u> <u>ation</u>	Japan and interna tional; historic al US brand name of the Supartz platfor m	<u>Roost</u> <u>er</u> <u>comb</u> <u>(Supa</u> <u>rtz/Ar</u> <u>tz</u> <u>platfo</u> <u>rm)</u>	<u>25 mg</u> <u>(1%)</u> <u>per</u> <u>2.5 mL</u>	<u>2.5</u> <u>mL</u>	<u>600–</u> <u>1200</u> <u>kDa</u>	<u>Non-</u> <u>cross-</u> <u>linked</u>	<u>Knee OA;</u> <u>1</u> <u>injection</u> <u>weekly x</u> <u>5; TMJ</u> <u>regimens</u> <u>of 5</u> <u>weekly or</u> <u>2</u> <u>injections</u> <u>2 weeks</u> <u>apart in</u> <u>published</u> <u>studies</u>	Level I: in a 246- patient double- blind trial Artzal, hylan G-F 20 and placebo all improved VAS weight- bearing pain with no between- group differenc es through 26 weeks; Durolane was non- inferior to ARTZ in WOMAC pain at 18 and 26 weeks (n = 349)	<u>Low local</u> <u>reaction</u> <u>rates, not</u> <u>significantl</u> <u>y different</u> <u>from</u> <u>comparato</u> <u>rs;</u> <u>hypersensit</u> <u>ivity.</u> <u>pregnancy/</u> <u>breastfeedi</u> <u>ng.</u> <u>hepatopath</u> <u>y and</u> <u>paediatric</u> <u>cautions</u>	n.a.	SV; DR unest ablish ed
Suplas yn 2 mL	n.a. (manuf acturer not stated on examin ed docum ents)	<u>CE-</u> <u>marke</u> <u>d</u> <u>(CE047</u> <u>3);</u> <u>approv</u> <u>ed in</u> <u>several</u> <u>countri</u> <u>es</u>	n.a.	<u>20</u> <u>mg/2</u> <u>mL</u> <u>(10</u> <u>mg/m</u> <u>L)</u>	<u>2 mL</u> <u>pre-</u> <u>filled</u> <u>syring</u> <u>e</u>	<u>500–</u> <u>1000</u> <u>kDa</u> <u>(low–</u> <u>interm</u> <u>ediate)</u>	n.a.	<u>Pain</u> <u>associate</u> <u>d with</u> <u>knee OA;</u> <u>one 2 mL</u> <u>injection</u> <u>weekly x</u> <u>3</u>	Level I (indirect): included in systemati c reviews of knee and ankle viscosupp lementati on in the FDA HA Safety Profile without separatel y reported product- specific outcomes	<u>No</u> <u>separately</u> <u>stated</u> <u>adverse-</u> <u>event rate</u> <u>in the FDA</u> <u>review</u>	n.a.	SV; DR unest ablish ed

Suplas yn 1- Shot (6 mL)	n.a.	EU/int ernatio nal	n.a.	n.a. for 6 mL prese ntatio n (conce ntrati on not separa tely stated)	<u>6 mL</u>	<u>500– 1000 kDa</u>	n.a.	<u>Knee OA; single 6 mL injection</u>	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Go-On	n.a. (Italy- market ed brand; manufa cturer not stated in the sources examin ed)	Italy/E U	n.a.	<u>25 mg (1%) per 2.5 mL</u>	<u>2.5 mL</u>	<u>800– 1500 kDa</u>	<u>Non- cross- linked</u>	<u>Knee and shoulder OA pain; 1 injection weekly x 5</u>	Level I: in the Berenbau m trial, strict OMERAC T-OARSI response <u>69.6% at T3–4 and 73.3% at T6 (n = 237)</u>	<u>Hypersensi tivity and joint infection contraindic ations; no product- specific AE rate in the FDA review</u>	n.a.	SV; DR unest ablish ed
Go-On Mini	n.a.	Italy/E U	n.a.	<u>10 mg (1%) per 1 mL</u>	<u>1 mL</u>	<u>800– 1500 kDa</u>	<u>Non- cross- linked</u>	<u>Hand, TMJ, foot and spine; 1 injection weekly x 3</u>	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Go-On Matrix	n.a.	Italy/E U	n.a.	<u>40 mg (2%) HA + 80 mg sorbit ol per 2 mL</u>	<u>2 mL</u>	<u>800– 1500 kDa</u>	<u>Non- cross- linked; sorbit ol antioxi dant</u>	<u>Knee OA pain; 1 injection weekly x 3</u>	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed

Hyalu brix	Fidia Farmac eutici S.p.A., Abano Terme, Italy	Italy/E U	n.a.	1.5% (15 mg/m L), 30 mg/2 mL	2 mL	1.5–2.0 MDa; >1500 kDa	Non- modifi ed (non- cross- linked)	OA / synovial- fluid substituti on; 1 injection weekly x 3	Level I (pooled): included in 5 RCTs of hip viscosupp lementati on (Liao 2019; 298 HA vs 293 placebo) with pain flare 7% vs 2.4%; overall HA adverse- event rate across 9 hip RCTs 29.0% (range 0– 49.7%)	Pain flare, haematom a, pruritus, transient post- injection pain, superficial infection	n.a. for 2 mL presen tation	SV; DR unest ablish ed
Hyalu brix 60 / HyalO ne	Fidia Farmac eutici S.p.A.	Italy/E U	n.a.	15 mg/m L; 60 mg/4 mL	4 mL	1500– 2000 kDa	Non- modifi ed	Knee and hip OA, synovial- fluid substituti on; regimen not reported in the review table	Level I (pooled, hip): Hyalubrix 8 mL arms included in systemati c reviews with no significan t differenc e in overall adverse events vs controls (RR 0.94, 95% CI 0.41– 2.20)	Pain flare and transient local events; hip administrat ion requires imaging guidance (per hip-OA literature)	€84.00 per 60 mg/4 mL syring e (reduc ed from €142.0 0) = USD 97.56 [CASH], access ed 9 Sep 2026 (Santa farma listing ; conver sion at ECB 8 Sep 2026 rate 1 EUR = 1.1614 USD)	SV; DR unest ablish ed

Sinovi al Forte 1.6%	IBSA Farmac eutici Italia Srl, Lodi, Italy	Italy/E U; EU- MDR class III with publish ed SSCP	Ferme ntatio n, witho ut chemi cal modifi cation	32 mg (1.6%) per 2 mL	2 mL; sets of 1, 3 or 5 syring es with 21 G needl es	800– 1200 kDa	Not chemi cally modifi ed	Single injection; platform indication : pain/redu ced mobility from degenera tive, post- traumatic or other joint disorders in large and small joints	Level I (platform): the 0.8% Sinovial formulati on is the FDA- approved Gelsyn-3 device (already tabulated in the main article) — 1.6% formulati on has no separate product- specific RCT in the sources examined	Do not inject into infected/se verely inflamed joints; avoid in pregnancy, breastfeedi ng and autoimmun e disease; not for intravascu lar or extra- articular injection	€93.90 per pack of 3 × 2 mL syring es = USD 109.0 6 (= USD 36.35/ syring e); €31.29 single syring e = USD 36.34 [CASH], access ed 9 Sep 2026 (Prima farma; ECB rate)	SV; DR unest ablish ed
Sinovi al One 2%	IBSA Farmac eutici Italia Srl	Italy/E U	Ferme ntatio n	50 mg (2%) per 2.5 mL	2.5 mL	800– 1200 kDa	Not chemi cally modifi ed	Single injection	None product- specific identified	As per platform SSCP contraindic ations	€50.79 = USD 58.99 [CASH], access ed 9 Sep 2026 (Prima farma)	SV; DR unest ablish ed

Sinovi al HL (hybrid H- HA + L-HA)	IBSA Farmac eutici Italia srl, Lodi; distribu ted by Laborat oires Genévr ier	France /EU; CE certific ation year 2015	n.a.	3.2% total: 32 mg high- MW HA + 32 mg low- MW HA per 2 mL	2 mL soluti on in a 2.25 mL glass syring e	High- and low- molecu lar- weight fractio ns; numeri c values not stated	No chemi cal modifi cation; patent ed therm al/hyb rid coope rative treatm ent; excipi ents NaCl, sodiu m phosp hate, water	Pain/decr eased mobility from arthrosis, post- traumatic disease or tendinop athy related to joint alteration s; maximum 3 injections dependin g on severity	Level IV: <u>in-vitro</u> <u>compatibi</u> <u>lity</u> <u>studies</u> <u>with</u> <u>platelet-</u> <u>rich</u> <u>plasma</u> <u>reported</u> <u>in the</u> <u>leaflet</u> ; no product- specific randomis ed trial identified	Hybrid- cooperativ e claim is not supported by product- specific clinical structural data	Sinovi al HL 64 mg; €71.49 = USD 83.03 ; Sinovi al HL 90: €101.4 9 = USD 117.8 7 [CASH], access ed 9 Sep 2026 (Prima farma)	SV; DR unest ablish ed
Intrag el 0.8% / Intrag el 1.6% / Jointe x / Jointe x Starte r / Yaral / Yaral Forte / GONY ALERT MD	IBSA Farmac eutici Italia Srl (SSCP covers Sinovial e Intragel and Gony Alert MD names)	Italy/E U (multi- brand licensin g of one platfor m)	Ferme ntatio n	0.8% = 16 mg/2 mL; 1.6% = 32 mg/2 mL	2 mL (mini varia nts 1 mL)	800– 1200 kDa	Non- cross- linked	0.8%: 1 injection weekly x 3–5; 1.6%: weekly x 3	Platform- level only (see Sinovial)	Alias risk: these are trade- name variants of one IBSA platform; do not count as independe nt products	n.a.	SV; DR unest ablish ed
Synocr om	Croma (brand family; manufa cturer attribut ion not stated in the sources examin ed)	Italy/E U	n.a.	20 mg (1%) per 2 mL	2 mL	1600 kDa	Non- cross- linked	All joints; pain, reduced mobility, OA, post- traumatic ; 1 injection weekly x 3–5	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed

Synocr om Forte	n.a.	Italy/E U	n.a.	40 mg (2%) per 2 mL	2 mL	2100 kDa	Cross- linked (cross- linker not stated)	All joints; regimen not reported	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Synocr om Forte One	n.a.	Italy/E U	n.a.	80 mg (2%) per 4 mL	4 mL	2100 kDa	Cross- linked	All joints; regimen not reported	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Crespi ne Gel	BioPoly mer GmbH & Co KG, Germa ny; market ed since 2009	Germa ny/EU	n.a.	1.0 mg/m L linear NaHA + 14 mg/m L cross- linked NaHA; per 2 mL; 1.0 mg + 14.0 mg	2 mL single : inject ion syring e	Describ ed as "virtual ly immea surably large"; numeri c value not stated	Cross- linked, highly stabilis ed 3-D gel	Single intra- articular injection (per SPC presentat ion)	None product- specific identified in the sources examined	Cross- linked gels carried an 18.8% minor adverse- event rate as a class in the ARTHURUM comparativ e analysis	CRESP INE GEL PLUS USD 319.0 0 per unit [DIST], access ed 9 Sep 2026 (Docto r Medic a)	SV; DR unest ablish ed
Hyrua n ONE	LG Chem, Ltd.	Approv ed in South Korea since 2013; CE mark 2014	Non- anima l	60 mg/3 mL (20 mg/m L)	3 mL	High molecu lar weight; numeri c value not stated	Cross- linked with 1,4- butan ediol diglyci dyl ether	Mild-to- moderate knee OA; one 60 mg/3 mL intra- articular injection	Level I: prospecti ve, active- controlle d, randomis ed multicent re non- inferiority trial vs Durolane in European patients (NCT0473 2793)	Single- injection cross- linked product; comparativ e trial vs an active control only (no placebo arm) (trial design)	n.a.	SV; DR unest ablish ed

Hyruan Plus	LG Chem, Ltd.	South Korea and export markets	n.a.	n.a. (not stated on manufacturer page)	n.a.	n.a.	n.a.	n.a.	None product-specific identified in the sources examined	Manufacturer page carries no specification data — insufficiently documented for a main table	n.a.	SV (label-level only); DR unestablished
Jonexa (Hylastan SGL-80)	n.a. (Italy-market ed)	Italy/EU	n.a.	42 mg per 4 mL; composition 80% cross-linked gel + 20% soluble HA	4 mL	900–1300 kDa	Cross-linked hybrid gel/fluorid (Hylastan SGL-80)	Knee OA pain and reduced mobility; single injection	None product-specific identified in the sources examined	Hylan-family products carry pseudoseptic-reaction concerns as a class	n.a.	SV; DR unestablished
Kartilage	n.a.	Italy/EU	n.a.	15.5 mg per 2 mL	2 mL	1500 kDa	Non-cross-linked; mannitol	Shoulder, knee, hip, ankle, interphalangeal joints; 1 injection weekly x 3	None product-specific identified	n.a.	n.a.	SV; DR unestablished
Kartilage Cross	n.a.	Italy/EU	n.a.	16 mg per 2.2 mL	2.2 mL	Not reported	Listed as non-cross-linked despite the "Cross" — name; mannitol added	Shoulder, hip, knee, ankle, interphalangeal joints; single injection	None product-specific identified	Brand name implies cross-linking that the source table does not confirm — flag the discrepancy if this product is cited	n.a.	SV; DR unestablished
Condrovisc (HA + carnosine)	n.a.	Italy/EU	n.a.	20 mg per 2 mL	2 mL	600–1000 kDa	Non-cross-linked; carnosine	OA and post-traumatic; 1 injection weekly x 4	None product-specific identified	Contraindicated with skin or joint infection and in pregnancy/breastfeeding	n.a.	SV; DR unestablished

Artros ulfur HA	n.a.	Italy/E U	n.a.	32 mg (1.6%) per 2 mL	2 mL	1000 kDa	Non- cross- linked	Pain, <u>reduced</u> <u>mobility</u> , OA, post- traumatic ; 1 <u>injection</u> weekly x 3	None product- specific identified	<u>Skin/joint</u> <u>infection</u> <u>contraindic</u> <u>ations</u>	n.a.	SV; DR unest ablish ed
Inartr al	n.a.	Italy/E U	n.a.	30 mg (1.5%) per 2 mL	2 mL	>1500 kDa	Non- cross- linked	OA / <u>synovial-</u> <u>fluid</u> <u>substituti</u> <u>on</u> ; 1 <u>injection</u> weekly x 3	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Struct ovial	n.a.	Italy/E U	n.a.	20 mg (1%) per 2 mL	2 mL	Not reporte d	Non- cross- linked	Reduced <u>mobility</u> , OA, post- traumatic ; 1 <u>injection</u> weekly x 3-5	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Promo via	n.a.	Italy/E U	n.a.	24 mg, 40 mg or 82.8 mg prese ntatio ns	2, 3 or 6 mL	1200- 1800 kDa	Non- cross- linked	Pain and <u>reduced</u> <u>mobility</u> ; 1 <u>injection</u> weekly x 3-5	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Proial	n.a.	Italy/E U	n.a.	20 mg per 2 mL	2 mL	Not reporte d	Non- cross- linked	Knee and <u>other</u> <u>joints</u> , <u>pain</u> ; 1 <u>injection</u> weekly x 3-5	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Viscop lus	n.a.	Italy/E U	n.a.	20 mg per 2 mL	2 mL	2000 kDa	Non- cross- linked	Pain and <u>reduced</u> <u>mobility</u> ; 1 <u>injection</u> weekly x 3-5	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed

Viscop lus Gel	n.a.	Italy/E U	n.a.	75 mg (2.5%) per 2 mL	2 mL	Not reporte d	Listed as non- cross- linked	Pain, <u>reduced</u> <u>mobility</u> , OA; <u>single</u> <u>injection</u>	None product- specific identified	n.a.	n.a.	SV; DR unest ablish ed
Hanox M-XL	n.a.	Used in publish ed ankle- OA studies (region not stated)	n.a.	n.a.	<u>2.2</u> <u>mL in</u> <u>one</u> <u>ankle</u> <u>study</u>	n.a.	n.a.	<u>Intra-</u> <u>articular</u> <u>viscosupp</u> <u>lementati</u> <u>on for</u> <u>ankle</u> <u>lesions</u>	Level I (indirect): included in the Boffa 2021 ankle systemati c review without product- specific outcomes (FDA HA Safety Profile)	No product- specific adverse- event data	n.a.	SV; DR unest ablish ed
Durola ne SJ (small -joint prese ntatio n)	n.a. (NASH A platfor m; Durola ne itself is already tabulat ed in the main article)	Italy/E U	<u>NASH</u> <u>A</u> <u>stabili</u> <u>sed</u> , <u>non-</u> <u>anima</u> <u>l</u>	<u>20 mg</u> <u>per 1</u> <u>mL</u>	<u>1 mL</u>	Not applica ble (stabilis ed gel)	<u>NASH</u> <u>A</u> <u>stabilis</u> <u>ation</u>	<u>Ankle</u> , <u>elbow</u> , <u>wrist</u> , <u>hand</u> , <u>foot and</u> <u>hip</u> ; <u>single</u> <u>injection</u>	Platform- level (Durolane) evidence only	Alias/varia nt flag: same NASHA platform as the excluded Durolane; belongs in a supplemen tal table as a small- joint presentatio n	n.a.	SV; DR unest ablish ed

Hyalart / Hyalectin	n.a.	Italy/Europe (historical trade names)	<u>Rooster- combined derivative Hyalgan platform</u>	<u>20 mg/2 mL (1%)</u>	<u>2 mL</u>	<u>500–730 kDa</u>	<u>Non-cross-linked</u>	<u>Knee OA, post-traumatic ; 1 injection weekly x 5 (Hyalart); 3 weekly (Hyalectin in Dougados 1993)</u>	Level I: 52-week saline-controlled study of 110 patients (Hyalectin) and isokinetic force/Lequesne study (Hyalart), grouped with Hyalgan as products with RCT-proven efficacy (Migliore Part 2)	Alias flag: historical trade names of the Hyalgan (excluded) platform	n.a.	SV; DR unestablished
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Appendix Table S2. Small-joint, temporomandibular, post-arthroscopy and tendon or soft-tissue products

Product/brand	Manufacturer	Geography / regulatory status	HA source	Conc/dose	Volume/pack	MW	Cross-linking / additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class
OSTENIL MINI	TRB Chemedica (UK contact address given)	UK/EU	n.a.	<u>10.0 mg/mL; 10 mg per syringe</u>	<u>1.0 mL</u>	n.a.	<u>NaCl, disodium phosphate, sodium dihydrogen phosphate, water; cross-linking not stated</u>	<u>Degenerative/traumatic changes of small synovial joints; lumbar facet joints, thumb saddle joint, finger/toe interphalangeal joints, proximal joint of great toe, TMJ; 1–3 weekly injections, repeat cycles as required</u>	Level IV (IFU only) in the sources examined; the Ostenil platform is cited in <u>hip and knee systematic reviews by the FDA HA review</u>	<u>Local pain/heat/redness/effusion; not recommended in children, pregnancy, lactation or inflammatory arthropathies</u>	n.a.	SV; DR unestablished

Rhizart hrum	n.a.	Italy/EU	n.a.	20 mg (2%) per 1 mL	1 mL	2 4 0 0 k D a	Non- cross- linked	Hand, foot and TMJ pain/reduc ed mobility; single injection	None produ ct- specif ic identi fied	n.a.	n.a.	SV; DR unesta bled
OSTEN IL TENDO N	TRB CHEMEDI CA AG, Germany	German y/UK/E U (SmPC publish ed by TRB Cheme dica UK)	n.a.	20.0 mg/mL (2.0%) ; 40 mg per syring e	2.0 mL pre- filled syring e	n. a.	Mannit ol (stated to help stabilis e the hyaluro nate chains), NaCl, disodiu m phosph ate, sodium dihydro gen phosph ate, water	Pain and restricted mobility in tendons with or without sheath — Achilles, epicondylu s humeri, supraspinat us, patellar, peroneal, biceps brachii tendons and iliotibial band; peritendino us or intrasheath injection once weekly × 2	Level IV in the sourc es exami ned (SmP C only; no produ ct- specif ic trial identi fied)	Very rare (<1 in 10,000) local discomfort, pain, heat, itching, bruising, redness, swelling; rare infection; not recommend ed in children, pregnancy, lactation or acute trauma; imaging guidance advised	USD 224. 13 per 40 mg/2 mL pre- filled syrin ge [CAS H], acce ssed 9 Sep 2026 (Bee ovita USD listin g)	SV; DR unesta bled
VISCO SEAL / VISCO SEAL SYRIN GE	TRB CHEMEDI CA AG, Feldkirch en/Munic h, Germany	German y/UK/E U	Ferme ntatio n- derive d sodiu m hyalur onate	5.0 mg/mL (0.5%)	10 mL pre- filled syring e	n. a.	NaCl, disodiu m phosph ate, sodium dihydro gen phosph ate, water; cross- linking not stated	Post- arthroscop y synovial- fluid substitutio n to relieve pain, improve mobility and promote joint recovery, used at the end of arthroscop y after the normal irrigation procedure	Level IV in the sourc es exami ned	Distinct use case (irrigation- fluid replacement, not chronic OA therapy)	n.a.	PU (synovi al-fluid substit ution after lavage) ; DR unesta bled

Tendo Vis	n.a. (NHS-listed appliance ; manufacturer not named in the tariff)	United Kingdom — listed in the NHS Drug Tariff Part IX under "Sodium hyaluronate injection"	n.a.	n.a. (dose not stated in the tariff)	<u>1 injection per listed unit</u>	n.a.	n.a.	<u>Listed as a sodium hyaluronate injection appliance, 1 injection</u>	None product-specific identified	Documentation limited to the reimbursement listing — listed for completeness only	£69.50 basic price per 1-injection unit = USD 94.14 [ASP — NHS Drug Tariff basic price], September 2026 (NHS Drug Tariff Part IX; ECB rate)	SV; DR unestablished
Integrity Implant / Integrity Implant System	<u>Anika Therapeutics, Inc.</u>	USA — FDA 510(k) cleared, classification "Mesh, surgical", class II; <u>K25099 Z decision 17 June 2025 adding 25 x 60 mm and 40 x 60 mm sizes</u>	Esterified HA (HYAF F-11)	Not a solution product — <u>knitted porous mesh of resorbable HYAFF-11 multifilament fibres plus non-resorbable polyethylene terephthalate fibres</u>	<u>Sheet sizes including 25 x 60 mm and 40 x 60 mm, sterile single use</u>	n.a.	<u>Composite HA-ester/PET textile; no additives stated</u>	<u>Augmentation layer over an injured tendon (tendon protector); implanted open or arthroscopically and secured with fixation</u>	Level III/company-reported: <u>Anika reports US surgeon adoption, international expansion and an ongoing prospective Integrity clinical study</u>	Contains a permanent synthetic (PET) component; 510(k) clearance is based on substantial equivalence, not on clinical superiority (clearance letter language)	n.a.	PU (mechanical augmentation); DR unestablished

Tactos et Injectable Bone Substitute	Anika Therapeutics, Inc.	USA — FDA 510(k) cleared (K212083 in 2021; K231968 in 2023), product code MQV	n.a.	HA is a liquid-phase component: dry powder of octocalcium phosphate, calcium carbonate and monocalcium phosphate; liquid of sodium phosphate dibasic, citric acid, hyaluronic acid, iohexol and water for injection	<u>1 cc to 4 cc kits with pre-loaded syringes and mixing system</u>	n.a.	HA functions as a rheology modifier/carrier in a settable calcium-phosphate cement (composition)	<u>Injectable, settable osteoconductive bone-graft substitute, mixed intra-operatively before implantation</u>	Level IV in the sources examined (substantial - equivalence file)	Not an HA therapy per se — HA is an excipient; must not be presented as HA-mediated bone regeneration	n.a.	PU; DR unestablished
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Appendix Table S3. Aesthetic injectables newly approved in the United States (2021-2026)

Product/brand	Manufacturer	Geography / regulatory status	HA source	Conc/dose	Syringe /pack	MW	Cross-linking / additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class

saypha MagIQ	CROMA- PHARM A GmbH, Leoben dorf, Austria	USA — FDA PMA P240008 approved 8 September 2025; CE mark May 2016; marketed under different trade names in more than 70 countries; never withdrawn for safety/effectiveness	HA produced by <i>Streptococcus</i> species	23 mg/ml HA with 0.3% w/w lidocaine	Pre- filled syringe, steam- sterilized; mean injected volume in the pivotal study 1.54 mL per nasolabial fold, 1.02– 1.06 mL at touch- up	n. a.	Cross- linked with 1,4- butane diol diglycidyl ether (BDDE); residual BDDE limited to 2 ppm	Injection into the mid and deep dermis for correction of moderate to severe facial wrinkles and folds (such as nasolabial folds) in adults over 21	Level I: randomized, blinded - evaluator, active-control led pivotal trial — NLF- SRS responders at week 24 82.2% (222/270) vs control 81.9% (221/270), difference 0.37% (95% CI –2.96 to 3.70), p < 0.0001 for non- inferiority; per: protocol 83.5% vs 83.5%	Injection- site reactions in 243/255 (95.3%) after initial treatment; contraindicated with severe allergies/an aphylaxis history, Gram- positive protein allergy, lidocaine and bleeding disorders	SAYPHA VOLUME with Lidocaine USD 69.00/ unit [DIST], accessed 9 Sep 2026 (Doctor Medica); no US listing found for the MagIQ SKU itself (n.a.)	VB; DR unestablished
saypha ChiQ	CROMA- PHARM A GmbH, Leoben dorf, Austria	USA — FDA PMA P250021 approved 12 June 2026; CE mark March 2016; >70 countries	<i>Streptococcus</i> species fermentation	23 mg/ml HA + 3 mg/ml lidocaine hydrochloride in phosphate- buffered saline	Pre- filled glass syringe; median injected volume 4.0 mL both cheeks at initial treatment and 1.0 mL at touch- up	n. a.	BDDE cross- linked; residual BDDE limited to 2 ppm	Cheek augmentation and restoring midface volume deficits in patients over 21, by subcutaneous and/or supraperiosteal injection	Level I: randomized active-control led non- inferiority trial with MVDSS responder primary endpoint at week 24 by blinded evaluator (pivotal design and endpoint definition)	Injection- site reactions recorded by diary in 467 patients after initial and 165 after repeat treatment; same contraindication set as MagIQ	n.a.	VB; DR unestablished

Belotero Volume (+) Lidocaine	Merz North America, Inc., Raleigh, NC	USA — FDA PMA P250020 approved 19 May 2026; registered in approximately 85 countries incl. Australia, Brazil, Canada, China, Chile, Colombia, EU, Mexico, UK; never withdrawn	HA of non-animal origin	26 mg/ml HA with 0.3% lidocaine	Injection volume in the trial did not exceed 12 mL (6 mL per cheek) for initial plus touch-up, and a further 6 mL at repeat treatment	n. a.	BDDE cross-linked (CPM-HA-V technology)	Deep (subcutaneous and/or supraperiosteal) injection to improve mid-face volume deficit or correct mid-face contour deficiencies in adults 22 years or older	Level I: randomised evaluation or blinded non-inferiority trial (ITT n = 202; PPS 143 vs 47) — MCFAS mean change -1.60 vs -1.5 comparator; MCFAS responder rate at week 12 95.8% (137/143) vs 95.7% (45/47)	Injection-site swelling 10.5%, pain 9.2%, haematoma 7.9%, induration 5.3%, mass 2.0%; most treatment-related events mild (82.7%); no severe treatment-related events	BELOT ERO VOLUME with Lidocaine USD 349.00 /unit [DIST], accessed 9 Sep 2026 (Doctor Medical Belotero page)	VB; DR unestablished
Belotero Intense (+) Lidocaine	Merz North America, Inc.	USA — FDA PMA P250016 approved 9 July 2026; first approved in the EU in October 2013 and currently registered/sold in 78 countries outside the US	Non-animal HA with trace gram-positive bacterial proteins	25.5 mg/ml HA with 3.0 mg/ml lidocaine	Pre-filled syringe co-packaged with two sterile 27 G ½" needles	n. a.	BDDE cross-linked, physiological phosphate buffer	Submucosal and/or subcutaneous implantation for lip augmentation in adults over 21	Level I: randomised trial with co-primary endpoints — MLFAS responder rate at week 8 tested against a 50% threshold plus non-inferiority in mean MLFAS change (margin -0.5, one-sided α 0.025), both required for success (statistical plan)	Injection-site swelling, induration, pain, discoloration, bruising, erythema, oedema and oral herpes each $\leq$ 5% after initial/touch-up treatment; contraindicated with amide-anaesthetic hypersensitivity	BELOT ERO INTENSE with Lidocaine USD 109.50 – 219.00 (outlet price range) [DIST], accessed 9 Sep 2026 (Doctor Medical)	VB; DR unestablished
RHA Redensify / RHA Redensify Mepi (also called RHA 1 Mepi)	TEOXANE SA, Geneva, Switzerland and	USA — PMA supplement P170002/S012 approved 22 December 2021; available in the EU and more than 40 countries; mepivacaine versions launched in the US in late 2024	<i>Streptococcus equi</i> bacterial fermentation	15 mg/g sodium hyaluronate with 0.3% lidocaine hydrochloride (Mepi version; 0.3% mepivacaine)	1 mL syringe with two 30 G ½" needles	n. a.	Both cross-linked and non-cross-linked HA chains; BDDE cross-linker; described as the least cross-linked device of the RHA range	Injection into the dermis and superficial dermis for correction of moderate to severe dynamic perioral rhytids in adults 22 years or older	Level I: 52-week prospective randomised controlled trial in moderate-to-severe dynamic perioral rhytids (Sundaram 2022)	Contraindicated with severe allergy/anaphylaxis history; gram-positive protein allergy; not for patients with certain pre-existing conditions per SSFD	TEOSYAL RHA1 USD 219.00 [DIST], accessed 9 Sep 2026 (Medical Depot Teosyal page)	VB; DR unestablished

RHA Redensify Eye / RHA Redensify Eye Lido	TEOXANE SA	USA — Panel-track PMA supplement P170002/S050 approved 12 May 2026	<i>Streptococcus equi</i> fermentation	15 mg/g NaHA; Eye Lido contains 0.3% lidocaine hydrochloride monohydrate. Eye contains 0.3% mepivacaine hydrochloride	1.0 mL pre-filled syringe; Eye Lido supplied with two 30 G ½" needles. Eye with one 30 G ½" needle and one 25 G 1½" cannula	n.a.	BDDE cross-linked, physiological buffer pH 7.3	Injection into the sub-dermis and supraperiosteum for correction of moderate to severe tissue volume deficiencies in the infraorbital region in adults aged 22 or older	Level I: panel-track supplement based on a dedicated infraorbital pivotal study; first US infraorbital indication for the RHA platform (SSED)	Infraorbital injection carries region-specific risks; EU experience for infraorbital hollows predates US approval	n.a. (no United States price listing identified)	VB; DR unestablished
RHA Dynamic Volume (formerly RHA 4 Mepi)	TEOXANE SA	USA — Panel-track PMA supplement P170002/S048 approved 18 September 2025	<i>Streptococcus equi</i> fermentation	23 mg/g NaHA with 0.3% mepivacaine hydrochloride	1.2 mL treatment syringe with two 27 G ½" needles	n.a.	BDDE cross-linked	Deep dermis to superficial subcutaneous injection for moderate to severe dynamic facial wrinkles and folds; RHA 4 also indicated subcutaneous-to-supraperiosteal for cheek augmentation/midface contour deficiencies, adults 22+	Level I: panel-track supplement (dynamic wrinkle indication) (SSED)	Naming change creates alias confusion with RHA 4 Mepi — must be recorded as a rename, not a new molecule (marketing history)	TEOSYAL RHA4 USD 279.00 [DIST], accessed 9 Sep 2026 (Medidata Depot)	VB; DR unestablished
RHA Kiss Volume	Teoxane S.A.	USA — real-time PMA supplement P170002/S055, labeling change (indications/trade name) approved 27 July 2026	n.a.	n.a.	n.a.	n.a.	n.a.	n.a. (labeling supplement; no SSED published)	None product-specific identified	Documented only through the openFDA PMA record — listed for completeness only until an SSED or IFU is published	TEOSYAL RHA KISS with Lidocaine USD 179.00 (2 × 0.7 mL) [DIST], accessed 9 Sep 2026 (Medidata Depot) — note this listing is for RHA Kiss, not confirmed as the Kiss Volume SKU	VB; DR unestablished

Appendix Table S4. Aesthetic fillers marketed outside the United States

Product /brand	Manufacturer	Geography / regulatory status	HA source	Concentration	Syringe /pack	MW	Cross-linking / additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class
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Juvéderm VOLITE	Allergan Inc. / Allergan Aesthetics, an AbbVie company (Vycross technology)	EU/UK/ MENA and Brazil (not FDA-approved); brand page confirms marketing outside the US	n.a.	n.a. (concentration not stated on the pages examined)	n.a.	Vycross blend of high- and low-molecular-weight HA (numeric values not stated)	Cross-linked HA gel with lidocaine	Intradermal micro-injection for skin quality/hydration (clinical use described)	Level III: retrospective cohort in a private Brazilian clinic (Dal'Asta Coimbra 2021)	Retrospective single-centre design; no controlled structural endpoint	Listed by a US-facing distributor without price ("VOLITE — no price on page") (Medica Depot Juvéderm page) → n.a.	VB; DR unestablished
Juvéderm VOLIFT / VOLIFT RETOUCH (with lidocaine)	Allergan Aesthetics (EU range)	EU/UK (not FDA-approved)	n.a.	n.a.	n.a.	n.a.	n.a.	EU-market Vycross range products for wrinkles/volume (indications not stated on the pages examined)	None product-specific identified	Only distributor documentation retrieved — listed for completeness only	VOLIFT with Lidocaine USD 449.00 ; VOLIFT RETOUCH with Lidocaine USD 219.00 [DIST], accessed 9 Sep 2026 (Medica Depot)	VB; DR unestablished
Juvéderm ULTRA 2 / ULTRA 3 / ULTRA 4 / ULTRA SMILE (EU nomenclature)	Allergan Aesthetics (EU range)	EU/UK; EU-numbered SKUs also appear in the US PMA record for Juvéderm 24 HV/30/30 HV gel implants	n.a.	n.a.	n.a.	n.a.	n.a.	EU wrinkle/lip indications (not stated on the pages examined)	None product-specific identified	Alias risk: EU numbering of the Juvéderm Ultra family already tabulated in the main article — supplemental/alias note only	ULTRA 2 USD 229.00 ; ULTRA 3 USD 325.00 ; ULTRA 4 USD 329.00 ; ULTRA SMILE USD 255.00 [DIST], accessed 9 Sep 2026 (Medica Depot)	VB; DR unestablished
Restylane Volyme (with lidocaine)	Galderma	EU/UK and other markets (not tabulated in the main article)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	None product-specific identified	Only a price listing was retrieved — listed for completeness only	USD 129.00 /unit [DIST], accessed 9 Sep 2026 (Doctor Medica)	VB; DR unestablished

Restylane Shapex	Galderma	European Union — approved under the Medical Device Regulation on 11 August 2026 for temporary augmentation of the chin region; approvals also span Europe, Canada and Brazil	n.a.	n.a. (concentration not stated)	n.a.	n.a.	Described as the "first and only bone-mimicking hyaluronic acid" providing greater projection with lower injection volumes	Temporary chin augmentation (EU label); approved indications vary by market	Company - reported regulatory milestone; no peer-reviewed pivotal data examined	"Bone-mimicking" is a mechanical/rheological claim; must not be reported as osseous regeneration	n.a.	VB; DR unestablished
Belotero Soft / Balance / Revive / Lips Shape / Lips Contour / Intense / Volume (UK-EU range)	Merz Aesthetics	UK/EU marketed range (Belotero Volume and Intense have now also reached the US market — see B3)	n.a.	n.a. on the UK range page	n.a.	n.a.	CPM cross-linking technology family (concentrations not stated on the page examined)	Range positioning for wrinkles, lips, volume and skin quality (UK range page)	Level I only for the US-approved Volume and Intense formulations (see B3)	Belotero Balance and Balance (+) are already tabulated in the main article — only Soft, Revive, Lips Shape and Lips Contour are genuinely new	SOFT with Lidocaine USD 199.00 ; REVIVE USD 139.00 ; LIPS CONTOUR with Lidocaine USD 139.00 ; LIPS SHAPE with Lidocaine USD 149.00 [DIST], accessed 9 Sep 2026 (Doctor Medic a)	VB; DR unestablished
TEOSYAL PureSense Redensity 2 (Redensity II)	TEOXANE SA / TEOXANE Laboratories, Geneva	EU/UK; CE0086	n.a.	15 mg/mL total HA	1 mL syringe	High-molecular-weight HA mix (numeric value not stated)	Mixture of cross-linked and non-cross-linked HA with BDDE bonds	Infraorbital/tear-trough and periorbital correction (brochure)	Level II–III: manufacturer-reported EYELIGHT clinical study of periorbital rejuvenation conducted in the UK and France (Teoxane newsroom)	Company-reported study; the US equivalent indication is covered by RHA Redensity Eye (Appendix Table S3)	USD 249.00 per 2 × 1 mL [DIST], accessed 9 Sep 2026 (Medica Depot)	VB; DR unestablished
TEOSYAL PureSense Redensity I	Teoxane SA	EU/UK	n.a.	n.a.	1 × 3 mL or 2 × 1 mL presentations	n.a.	n.a.	Skin-quality/mesotherapy-type use (not stated on the pages examined)	None product-specific identified	Supplemental table	USD 139.00 (1 × 3 mL) / USD 119.00 (2 × 1 mL) [DIST], accessed 9 Sep 2026 (Medica Depot)	VB; DR unestablished

TEOSYAL PureSense Deep Lines / Global Action / Kiss / Ultimate / Ultra Deep	Teoxane SA	EU/UK	n.a.	n.a.	Ultra Deep 2 × 1.2 mL; Ultimate 2 × 1 mL or 1 × 3 mL	n.a.	n.a.	Wrinkle, lip and deep-volume indications (not stated on the pages examined)	None product-specific identified	Supplemental table; distinct from the FDA-approved RHA line	Deep Lines USD 199.00; Global Action USD 199.00; Kiss USD 229.00; Ultimate USD 229.00; Ultra Deep USD 114.50 – 229.00 [DIST], accessed 9 Sep 2026 (MediCa Depot)	VB; DR unestablished
STYLAG E range (S / M / L / XL / XXL, Bi-Soft, Bi-Flex, Lips Plus, Special Lips)	Vivacy Laboratories, Paris, France	EU/UK/ Brazil (lidocaine versions were not yet available in Brazil at publication) (review)	n.a.	Filler products range from 16–26 mg/dL as printed in the source (units as published)	n.a.	n.a.	IPN-Like ("interpenetrated cross-linked networks") technology from association of two or more previously cross-linked monophasic HA chains; mannitol added as antioxidant	Facial volume replacement and attenuation of grooves and wrinkles; in the authors' practice mainly nasolabial groove, malar and chin regions	Level III/IV: physicochemical review with clinical experience series (Ramos-Silva 2013)	The published concentration unit ("mg/dL") is internally inconsistent with standard filler units — quote verbatim and flag	S Bi-Soft USD 149.00; M USD 159.00; M Bi-Soft with Lidocaine USD 169.00; L Bi-Soft/ Bi-Flex USD 179.00; L with Lidocaine USD 189.00; HYDRO Bi-Soft USD 69.00; HYDRO OMAX Bi-Soft USD 99.00; LIPS PLUS USD 139.00 [DIST], accessed 9 Sep 2026 (MediCa Depot)	VB; DR unestablished
STYLAG E Hydro	Vivacy	EU/UK/ Brazil	n.a.	14 mg/mL	n.a.	n.a.	HA in its natural non-cross-linked form; mannitol described as a line-wide antioxidant	Skin hydration/quality (review)	Level IV	Non-cross-linked hydrator — hydration effect only	USD 69.00 (Hydro Bi-Soft) [DIST], 9 Sep 2026 (MediCa Depot)	VB; DR unestablished

Perfectha Fine Lines	Laboratory Obviele, a Sinclair IS Pharma company (France)	EU/UK; class III device, European CE mark 2007, UK launch 2011	n.a.	20 mg/mL; 180,000 gel particles/mL	0.5 mL	n.a.	E-Brid cross-linking technology (covalent bonds between and within HA particles)	Superficial dermis; superficial wrinkles including crow's feet and perioral lines	Level IV in the sources examined	Particle-size-defined range; no product-specific randomised trial identified	FINELINES USD 79.00 [DIST], 9 Sep 2026 (Medica Depot)	VB; DR unestablished
Perfectha Derm	Obviele / Sinclair	EU/UK; CE 2007, class III	n.a.	20 mg/mL; 90,000 gel particles/mL	1 mL	n.a.	E-Brid cross-linking	Mid dermis; moderate wrinkles, frown lines, deeper furrows around eyes and mouth, contour	Level IV	—	DERM USD 109.00; DERM Lidocaine USD 89.00 [DIST], 9 Sep 2026 (Medica Depot)	VB; DR unestablished
Perfectha Deep / SubSkin	Obviele / Sinclair	EU/UK; CE 2007, class III	n.a.	20 mg/mL (particle density decreasing with gel grade)	n.a.	n.a.	E-Brid cross-linking	Deeper dermal/subdermal volume restoration (range description)	Level IV	—	DEEP USD 79.00; DEEP Lidocaine USD 89.00; SUBSKIN USD 203.15 – 239.00 [DIST], 9 Sep 2026 (Medica Depot)	VB; DR unestablished
saypha Rich / Filler / Volume (ex-US range)	Croma	EU and >70 countries (per the MagIQ SSED marketing history)	Streptococcus fermentation (platform)	n.a. on the range page; US SKUs of the same platform are 23 mg/mL	n.a.	n.a.	Advanced cross-linking to a stable 3-D HA network (BDDE in the US SKUs)	Rich: skin quality, hydration, superficial refinement; Filler: fine lines and moderate wrinkles	Level I for the US SKUs (see B3); range pages give no trial data	Trade-name harmonisation means saypha SKUs correspond to previously differently named Croma products (>70-country marketing history)	SAYPHA VOLU ME with Lidocaine USD 69.00 [DIST], 9 Sep 2026 (Doctor Medica)	VB; DR unestablished
Aliaxin EV / SR (Essential Volume / Shape & Restore)	IBSA Derma	EU/UK	n.a.	n.a. (not stated on the pages examined)	EV supplied as 2 pre-filled syringes of 1 mL	n.a.	n.a.	Resorbable medical device for facial shaping/restoration	None product-specific identified	Manufacturer pages give no composition data — listed for completeness only	ALIAXIN EV USD 79.50–159.00 (2 × 1 mL) [DIST], 9 Sep 2026 (Medica Depot)	VB; DR unestablished
Neauvia Organic Intense	MATEX LAB SPA, Brindisi, Italy	Italy/EU — class III device under EU MDR 2017/745	n.a.	28 mg/mL as listed by the distributor	n.a.	n.a.	PEG (polyethylene glycol) cross-linker; all Neauvia gels enriched with glycine and L-proline	Correction of moderate-to-severe nasolabial folds (post-market study)	Level II: post-market, prospective, open-label, single-centre study (Zerbinati 2024)	Open-label single-centre design; PEG cross-linking differs chemically from BDDE products and should not be pooled with them	USD 79.00 (1 × 1 mL) [DIST], 9 Sep 2026 (Health Supplies Plus)	VB; DR unestablished

Neauvia Organic Intense LV / Rheology / Flux / Lips / Rose / Man	<u>MATEX LAB SPA</u>	Italy/EU, class III	n.a.	<u>Intense LV 26 mg/mL; Intense Flux 26 mg/mL; Intense Rheology 22 mg/mL</u>	n.a.	n.a.	<u>PEG cross-linked, glycine + L-proline</u>	Region-specific volumising/lip indications (<u>range page</u>)	None product-specific identified per SKU	SKU-level data are thin; keep as one family row plus a supplemental SKU list	Intense LV USD 79.00 ; Intense Rheology USD 79.00 ; Intense Flux USD 99.00 ; Intense Lips USD 79.00 ; Intense Rose USD 79.00 [DIST], 9 Sep 2026 (Health Supplies Plus)	VB; DR unestablished
REVOLAX Fine / Deep / Sub-Q (± lidocaine)	n.a. (Korean manufacturer; not named on the examined technical page)	Korea/EU/UK — <u>described as a medical-grade class III dermal filler</u>	<u>Streptococcus zooepidemicus fermentation</u>	<u>24 mg/mL HA; lidocaine 0.3% in the lidocaine versions</u>	<u>1.1 mL</u>	n.a.	<u>BDDE cross-linked; BDDE residue reported as "not detected"</u>	<u>Fine: superficial lines, worry lines, crow's feet, neck wrinkles; Deep/Sub-Q: lips, deep nasolabial folds, face contouring and augmentation</u>	None product-specific peer-reviewed trial examined	Technical claims come from a distributor-hosted manufacturer page, not a regulator document	DEEP / SUB-Q / FINE with lidocaine each USD 59.00 (1.1 mL) [DIST], 9 Sep 2026 (Health Supplies Plus)	VB; DR unestablished
Neuramis Deep	<u>Medytox, Seoul, Korea</u>	Korea and export markets (regulatory status not stated in the trial report)	n.a.	n.a. (concentration not stated in the source trial)	n.a.	n.a.	<u>SHAPE two-step cross-linking with enhanced purification; BDDE listed in the abbreviation on legend</u>	<u>Nasolabial-fold correction; intradermal injection with a 27 G needle, recommended dose <1 mL per side</u>	<u>Level I: phase III randomized, double-masked, matched-pairs, active-controlled trial vs Restylane — WSRs change at 24 weeks 0.50 ± 0.66 vs 0.34 ± 0.65 (ITT); at 8 weeks 1.63 ± 0.54 vs 1.44 ± 0.61, $p = 0.001$ (ITT)</u>	<u>Local adverse events in 84.06% (58/69); bruising 69.57% (48/69), oedema 62.32% (43/69); difference vs Restylane not statistically significant</u>	NEURAMIS VOLU-ME with Lidocaine USD 59.00 [DIST], 9 Sep 2026 (Doctor Medicale); USD 59.00 with tiered pricing to USD 55.00 for 11–20 packs (Med Supply Solutions)	VB; DR unestablished

YVOIRE Classic	LG Chem, Ltd., Seoul, Republic of Korea	Korea and export markets	n.a.	22 mg/mL	n.a.	n.a.	BDDE; proprietary "high concentration equalized cross-linking technology"	Moderate-to-severe facial wrinkles and folds such as nasolabial folds; ≤1.5 mL per side, optional touch-up at 2 weeks	Level I: randomized controlled trial with WRS primary endpoint at week 26 — mean WRS 2.56 at week 26 with responder rates 81.03% at week 2 and 56.14% at week 26	Responder rate roughly halves between week 2 and week 26 — duration limitation (trial data)	n.a.	VB; DR unestablished
YVOIRE Y-Solution 720	LG Chem, Ltd.	Approved in the Republic of Korea in 2016; trial conducted in China	n.a.	20 mg/mL HA with 3 mg/mL (0.3%) lidocaine hydrochloride	Maximum 6.0 mL per midface for initial plus touch-up treatment	n.a.	BDDE with Stable High-Concentration Equalized (S-HICE) cross-linking and reduced BDDE usage	Midface volume deficiency including sunken cheeks; MFVDA-SRS 2–4 at baseline	Level I: multicentre, randomized, evaluator-blind, no-treatment-controlled study with MFVDA-SRS responder and GAIS endpoints plus 3-D photographic volumetry (Yu 2026)	No-treatment control (not an active or sham comparator) (design)	n.a.	VB; DR unestablished
e.p.t.q. S300 (and e.p.t.q. range)	JETEMA Co., Ltd., Yongin, Korea	Korea and export markets (regulatory status not stated in the source publications)	n.a.	n.a. (concentration not stated in the source publications)	n.a.	n.a.	Cross-linked HA with lidocaine (agent not stated)	Mid-face rejuvenation by injection into the upper antero-medial cheek in the pilot study; aesthetic facial rejuvenation/beautification in the 2026 post-market study	Level II–III: 1- and 2-year prospective blinded pilot evaluation in 11 Korean subjects with GAIS and Morpheus 3-D assessment (Wan 2025); plus a 2026 post-market clinical follow-up study (Sci Rep 2026)	Small pilot sample (n = 11); adverse event rates not stated	n.a.	VB; DR unestablished

JO 30-L (30 mg cross-linked HA facial filler)	Biotech Vision Care Pvt. Ltd., Ahmedabad, India	India (regulatory status not stated)	n.a.	30 mg/mL	0.5 mL, 0.8 mL or 1.0 mL	n.a.	Cross-linked (agent not stated)	Facial wrinkles, lip enhancement, cheekbone augmentation, nasolabial folds, marionette lines	Level II: prospective clinical evaluation powered for a 10% GAIS responder improvement (target 97 patients); vermilion-border definition improvement odds ratio 9.31 at 1 year	Single-arm prospective design; regional product with limited regulatory documentation	n.a.	VB; DR unestablished
HYAcorp Face / Lips / MLF1 / MLF2 (body contouring)	BioScience GmbH (HYAcorp brand)	CE-mark approved; HYAcorp approved in over 70 countries	n.a.	High HA concentration; exact concentration not stated	HYAcorp Face supplied as 2 pre-filled syringes, 2 mL packaging size	n.a.	n.a.	Body-contouring and facial volumisation (MLF1/MLF2 for body) (product page)	None product-specific identified	Large-volume body filler category — the historical Macrolane experience (below) is the cautionary precedent	LIPS USD 99.00; MLF1 USD 169.00; MLF2 USD 169.00; FACE USD 219.00 [DIST], 9 Sep 2026 (Medica Depot)	VB; DR unestablished
Macrolane	n.a. (manufacturer not stated in the FDA review)	Breast-augmentation use discontinued, reflected in a manufacturer alert (FDA HA Safety Profile)	n.a.	n.a.	30–40 mL in a penile-augmentation study; mean 136 mL (range 20–200 mL) in a breast-enhancement study	n.a.	n.a.	Breast enhancement and penile augmentation as studied; single injection	Level III: prospective single-arm breast series (n = 194) — minor adverse events 12.4% (24), major 8.7% (17), infection 0.5% (1); retrospective complication series (n = 20) — all with lumps, rapid asymmetric volume loss; ≥85% of filler surgically removed in all patients; cysts within 12 months	Withdrawal precedent: breast use discontinued; imaging interference and explantation burden (FDA review)	n.a.	VB (historical); DR unestablished

Appendix Table S5. Skin boosters, bioremodelling and hybrid (HA plus non-HA) injectables

Product /brand	Manufacturer	Geography / regulatory status	HA source	Conc/dose	Syringe /pack	MW	Cross-linking / additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class
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Research Article | Kume MH, et al. *J Clin Pract Med Case Rep.* 2026, 3(2)-42.

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VISCOD ERM hydroboster	IBSA Derma (leaflet published by IBSA Derma France)	France/EU (CE marking of the device itself not stated on the leaflet; the 0197 mark shows no relationship to the co-packaged Terumo needles)	Non-animal origin, bacterial fermentation	25 mg/g cross-linked HA	1.1 mL pre-filled syringe with 29 G x ½" needles	n.a.	Cross-linked (agent not stated); phosphate buffer and water for injection	Injectable device to restore intradermal hydration and improve skin structure and elasticity	None product-specific trial examined	Hydration/structure claims are label claims; no controlled structural endpoint examined	USD 69.30–99.00 [DIS TJ], 9 Sep 2026 (Medical Depot)	VB; DR unestablished
VISCOD ERM Skinkò E / Skinkò kit	IBSA Derma	EU	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	None examined	Documented only by a price listing	USD 349.00 [DIS TJ], 9 Sep 2026 (Medical Depot)	VB; DR unestablished
Sunekos 200 (HA + amino acids)	Professional Dietetics, Milan, Italy	Described as a class III product in the study	n.a.	Lyophilized 100 mg of glycine, L-proline, L-leucine, L-lysine HCl, L-valine and L-alanine, reconstituted with HA solution; HA concentration not stated	Reconstituted with 3 mL diluent in the study	n.a.	Non-cross-linked HA plus six amino acids (cross-linking not stated)	Mild-to-moderate correction of facial/body photoaging signs; 3 microinjection sessions at 15-day intervals in the periorbital study	Level II–III: prospective periorbital rejuvenation study (Kabakci 2023)	Amino-acid co-formulation means effects cannot be attributed to HA alone	n.a.	VB; DR unestablished

HA ^{Ar} mon yCa / HA ^{Ar} mon yCa Lidocaine (HA + calcium hydroxy apatite hybrid)	<u>Allergan</u> <u>Aesthetics</u> , an <u>AbbVie</u> <u>company</u>	Ex-US mark ets (FDA status not stated in the sourc es exami ned)	n.a.	20 mg/mL cross- linked sodium hyaluro nate with embedd ed calcium hydroxy apatite microsp heres of 25–45 µm at 55.7% wt/wt, plus lidocain e	Two pre- filled syringe s of 1.25 mL each; 2.5 mL total per packag e	n. a.	Cross- linked HA carrier + CaHA microsp heres; no formal labeled dosing regime n stated	Facial soft- tissue augment ation with immedia te volume/l ift; small homoge neously distribut ed volumes into superfici al fat compart ments, deep subcuta neous or supraper iosteal	Level II: prospecti ve open- label post- marketin g study — MFVDS responde r rate 82.8% at month 1, sustained through month 12; GAIS responde r 98.5% investiga tor-rated and 91.8% participa nt-rated; retrospec tive 9- centre series of 162 participa nts with no adverse events over ≥18 months and no ultrasono graphic inflamma tion or granulo mas in 64 participa nts	Treatment- related events: injection- site pain 11.4%, injection- site mass 10.7%, headache 7.1%; "neocollag enesis" is a mechanisti c claim, not a demonstra ted human structural- restoration endpoint	n.a.	VB (biostim ulatory claim); DR unestabl ished
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Appendix Table S6. Ophthalmic viscosurgical devices

All are US class III devices under product code L郑 (regulatory classification). HA source, where stated, is bacterial fermentation except where rooster comb is specified. Class for every row: PU (platform utility — intraocular tissue protection and space maintenance); DR unestablished.

Product/ brand	Manufact urer	Geography / regulatory status	HA source	Conc/d ose	Deliver ed volum e / pack	MW	Rheology / additives	Indicati on	Strongest product- specific human evidence (level)	Adverse effects / limitation s	Pri ce
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Healon PRO	<u>Johnson & Johnson</u>	USA — PMA P810031 family, original approval 14 January 1983, with 2025–2026 process-change supplements	<u>Bacteria ! fermentation</u>	1% sodium hyaluronate (10 mg/mL)	0.85 mL or 0.55 mL glass syringes with 27 G cannula	3.2×10^6 Da	Cohesive; buffered solution components not specified in labeling	<u>Surgical aid for cataract extraction, IOL implantation, corneal transplant, glaucoma filtration and other anterior segment procedures</u>	Level I (platform): in a 36-RCT systematic review of 3,893 subjects Healon was associated with a significant day-1 IOP rise (standardized mean difference 0.37, CI 0.07–0.67); in a 249-eye RCT vs DisCoVisc, IOP ≥ 30 mmHg occurred in 13.3% at 6 h, 6.2% at 24 h and 0.9% at day 7	<u>Transient postoperative IOP elevation; severe corneal oedema in 1 eye</u>	n. a.
Healon GV PRO	<u>Johnson & Johnson (PRO family)</u>	USA — same P810031 family	n.a.	1.4% HA stated in one study	0.4 mL in one study; up to 8 injections in a canaloplasty protocol	n.a.	Cohesive, higher-viscosity variant	<u>Anterior segment surgery and glaucoma procedures</u>	Level I/III: 1-week IOP reduction standardized mean difference –0.50 (CI –0.89 to –0.11); canaloplasty series of 162 eyes with Descemet membrane detachment in 12 patients (7.4%), all resolving in 4–10 weeks, 3 requiring further surgery	<u>Descemet membrane detachment, intracorneal haemorrhage, corneal decompensation</u>	n. a.
Healon5 PRO	<u>Johnson & Johnson</u>	USA — P810031 family	<u>Bacteria ! fermentation</u>	2.3% sodium hyaluronate (23 mg/mL)	0.6 mL glass syringe with 25 G cannula	3.2×10^6 Da	Viscoadaptive/cohesive	<u>Anterior segment surgery</u>	Level I: day-1 IOP rise not significant (SMD 0.15, CI –0.33–0.64); 1-week IOP reduction significant (SMD –0.42, CI –0.68 to –0.17)	<u>Complete removal emphasized because of greater viscosity and higher concentration than other OVDs</u>	n. a.

Healon EndoCoat	Johnson & Johnson	USA — PMA P110007, original approval 2 July 2012	Bacteria ! fermentation	3% sodium hyaluronate (30 mg/mL)	0.85 mL glass syringe with 25 G cannula and cannula guard	8×10^5 Da	Dispersive; contains NaCl, KCl, CaCl ₂ , MgCl ₂ and buffer per mL	Surgical aid in anterior : segment procedures including cataract surgery with IOL implantation	Level IV/regulatory	2014 recall: finger grip dislodged while depressing the syringe plunger (Abbott Medical Optics)	n. a.
Healon Duet PRO / Healon Duet PRO II	Johnson & Johnson	USA — P810031/P 110007 families; 2025 supplements S080/S081 approved 28 October and 16 December 2025	Combination pack	Combination of Healon PRO and Healon EndoCoat	Dual-pack	See components	Soft-shell technique (cohesive + dispersive)	Surgical aid in anterior : segment procedures	Level IV	Component-level data only	n. a.
ProVisc	Alcon	USA — PMA P890047, original approval 26 September 1991; 2026 manufacturing-site supplement	Bacteria ! fermentation	1% sodium hyaluronate (10 mg/mL)	0.40, 0.55 or 0.85 mL glass syringes with 27 G cannula and locking ring	2.5×10^6 Da	Cohesive; phosphate/N aCl buffer	Cataract extraction and IOL implantation	Level II: clinical comparison with Healon in cataract surgery	Class-level IOP-elevation risk	n. a.
Viscoat	Alcon	USA — PMA P840064, original approval 30 April 1986; 2026 location-change supplement	Bacteria ! fermentation for the HA component	3% sodium hyaluronate (30 mg/mL) + 4% sodium chondroitin sulfate (40 mg/mL)	0.5 or 0.75 mL glass syringes with 27 G cannula	$>5 \times 10^5$ Da (HA); 2.25×10^4 Da (chondroitin sulfate)	Dispersive combination device	Cataract extraction and IOL implantation	Level I: day-1 IOP rise SMD 0.29 (CI 0.13–0.45); corneal-oedema rates across HA OVDs 0.6–2.5%; macular oedema 0.6–0.9%; "Viscoat bubbles" in 1 patient (0.9%)	Dispersive OVDs adhere to ocular structures and may be harder to remove, increasing IOP risk	n. a.
DuoVisc	Alcon	USA — P840064 family	Combination pack	ProVisc + Viscoat co-pack	Dual-pack	See components	Soft-shell technique	Anterior : segment surgery	Level IV	Component-level data only	n. a.

DisCoVisc	Alcon	USA — P840064 family	Bacteria! fermentation (HA); cartilage-derived chondroitin sulfate	1.65% sodium hyaluronate (17 mg/mL) + 4% sodium chondroitin sulfate (40 mg/mL)	0.5 mL or 1 mL syringe with 27 G cannula and locking ring	1.7 × 10 ⁶ Da (HA); 2.25 × 10 ⁴ Da (chondroitin sulfate)	Viscous-dispersive	Cataract extract on and IOL implantation	Level II: comparative trials vs Healon and vs Healon5; 249-eye RCT (121 Healon vs 128 DisCoVisc)	Class-level IOP risk	n. a.
Amvisc	Bausch + Lomb	USA — PMA P810025, original approval 18 October 1983	Bacteria! fermentation	1.2% sodium hyaluronate (12 mg/mL)	0.8 mL single-use glass syringe with 27 G cannula	1 × 10 ⁶ –2.9 × 10 ⁶ Da	Cohesive	Anterior and posterior or segment procedures including cataract extraction, IOL implantation and corneal transplant	Level IV	2012 recall of co-packaged 27 G cannulas; 2005 sterility recall of Amvisc syringes	n. a.
Amvisc Plus	Bausch + Lomb	USA — P810025 family	Bacteria! fermentation	1.6% sodium hyaluronate (16 mg/mL)	0.8 mL syringe with 27 G cannula	1 × 10 ⁶ –2.9 × 10 ⁶ Da	Cohesive	As Amvisc	Level IV	As Amvisc	n. a.
Anikavisc	Anika Therapeutics	USA — Anika OVD family PMA P000046 (StaarVisc II original approval 18 April 2001; 2026 process supplement)	Rooster combs	1.2% sodium hyaluronate (12 mg/mL)	0.8 mL glass syringe with cannula	>1 × 10 ⁶ Da	Cohesive; NaCl and sodium phosphate excipients	Anterior and posterior or segment surgery	Level IV	Avian-derived — relevant to the comparison of avian and biofermentation origin (source)	n. a.
NuVisc	Beaver-Visitec International Inc	USA	Rooster combs	1.2% sodium hyaluronate (12 mg/mL)	0.8 mL glass syringe with 27 G cannula	1 × 10 ⁶ –2.9 × 10 ⁶ Da	Cohesive	Anterior and posterior or segment surgery	Level IV	Avian-derived	n. a.
Biolon	Amring Pharmaceuticals	USA — PMA P960011, original approval 16 July 1998	Bacterially derived	1% sodium hyaluronate (10 mg/mL)	2.25 mL syringe containing 1 mL of product, 27 G cannula	3 × 10 ⁶ Da	Cohesive	Extracapsular cataract extraction and IOL implantation	Level IV	—	n. a.

ClearVisc	Bausch Health	USA — PMA P200025 approved 23 March 2021; had not been marketed in the US or any foreign country before approval	<i>Streptococcus pyogenes</i>	25 mg/mL sodium hyaluronate + 40 mg/mL sorbitol	1 mL glass syringe with 25 G thin-wall blunt cannula and retention clip	Average 750,000 Da	Dispersive; viscosity 40 Pa·s at 25 °C and shear rate 1 s ⁻¹ ; osmolality ≈330 mOsm/kg; sorbitol as free-radical scavenger component	Surgical aid in anterior segment procedures including cataract extraction and IOL implantation	Level I (pivotal PMA trial; no known contraindications stated)	Known OVD risk of transient postoperative IOP increase	n.a.
StableVisc	Bausch Health	USA — PMA P220009 approved 22 February 2023; had not been marketed anywhere before approval	<i>Streptococcus pyogenes</i>	10 mg/mL sodium hyaluronate + 40 mg/mL sorbitol	1 mL glass syringe with 27 G blunt cannula and retention clip	Average 2,100,000 Da	Cohesive; viscosity 50 ± 15 Pa·s at 25 °C, shear rate 1 s ⁻¹ ; osmolality ≈340 mOsm/kg	Cataract extraction and IOL implantation	Level I (pivotal PMA trial)	Transient postoperative IOP increase	n.a.
TotalVisc	Bausch Health	USA — approved under P220009 as StableVisc co-packaged with previously approved ClearVisc	See components	Combination of a cohesive (Stable Visc) and a dispersive (ClearVisc) OVD	Dual-pack	See components	Soft-shell technique	Anterior segment surgery	Level I for StableVisc only; only StableVisc was studied under this application	Combination-pack evidence is component-derived	n.a.
StaarVisc II	Anika Therapeutics (PMA holder)	USA — PMA P000046 approved 18 April 2001; Anika Ophthalmic Viscosurgical Device Family supplement approved 28 August 2026	n.a.	12 mg/mL, 0.8 mL syringe as described in recall records	0.8 mL	n.a.	n.a.	Intraocular surgical aid	Level IV	2005 recalls for potential ly compromised sterility (incomplete heat seals in cannula pouches)	n.a.
Vitrax	Abbott Medical Optics, Inc. (PMA holder of record)	USA — PMA P880031 approved 10 August 1989	n.a.	n.a.	n.a.	n.a.	n.a.	Ophthalmic viscoelastic surgical aid	Level IV	Legacy device; specifications not in the examined formulary review	n.a.

Appendix Table S7. Topical ophthalmic products: tear substitutes and eye ointments

Class for every row: PU (ocular-surface lubrication/hydration); DR unestablished. All NHS prices are Drug Tariff Part IX basic prices for September 2026, converted at 1 GBP = 1.35456 USD (ECB, 8 September 2026).

Product/brand	Manufacturer	Geography / regulatory status	Concentration (claimed / measured)	Pack	Additives	Indication	Evidence	Price (type, date, unit)
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Hylo-Tear 0.1%	<u>Ursapharm (Hylo family)</u>	UK/EU; NHS-listed appliance	0.1%; Hylo Fresh measured 0.03% vs 0.03% claim (37-tear-substitute analysis)	<u>10 mL preservative-free e-free bottle</u>	Preservative-free	Dry-eye lubrication	Level IV (physicochemical characterisation)	£8.50 = USD 11.51 [ASP — NHS basic price], Sep 2026 (NHS Drug Tariff)
Hylo-Forte 0.2%	Ursapharm	UK/EU; NHS-listed	0.2%	<u>10 mL preservative-free e-free bottle</u>	Preservative-free	Moderate-to-severe dry eye	Level IV	£9.50 = USD 12.87 [ASP], Sep 2026 (NHS Drug Tariff)
Hylo-Dual / Hylo Dual Intense	Ursapharm	UK/EU; NHS-listed	n.a. (HA + ectoine combination; concentration not stated in the tariff)	<u>10 mL preservative-free e-free bottle</u>	Ectoine	Dry eye with allergic component	Level IV	£9.95 = USD 13.48 [ASP], Sep 2026 (NHS Drug Tariff)
Hylo-Care / Hylo-Fresh	Ursapharm	UK/EU; NHS-listed	Hylo Fresh claimed 0.03%, measured 0.03% (recovery 100%)	<u>10 mL preservative-free e-free bottles</u>	Hylo-Care contains dexpanthenol per brand positioning (not stated in the sources examined)	Dry eye/corneal care	Level IV	Hylo-Care £10.30 = USD 13.95 ; Hylo-Fresh £4.95 = USD 6.71 [ASP], Sep 2026 (NHS Drug Tariff)
Vismed / Vismed Multi / Vismed Gel / Vismed Gel Multi	<u>TRB</u>	UK/EU; NHS-listed	Vismed Multi claimed 0.18%, measured 0.18% (recovery 102%); Vismed Gel Multi claimed 0.30%, measured 0.31% (recovery 104%)	Vismed 20 × 0.3 mL single-dose units; Vismed Multi 10 mL bottle; Vismed Gel 20 × 0.45 mL; Vismed Gel Multi 10 mL	Preservative-free	Dry-eye lubrication	Level IV (measured concentration and intrinsic viscosity)	Vismed £5.42 = USD 7.34 ; Vismed Multi £7.23 = USD 9.79 ; Vismed Gel £6.35 = USD 8.60 ; Vismed Gel Multi £8.44 = USD 11.43 [ASP], Sep 2026 (NHS Drug Tariff)

Hyabak	Théa	UK/EU; NHS-listed	<u>Claimed 0.15%, measured 0.15% (recovery 102%)</u>	<u>10 mL preservative-free bottle</u>	Preservative-free	Dry-eye lubrication	Level IV	£7.99 = USD 10.82 [ASP], Sep 2026 (NHS Drug Tariff)
Thealoz Duo / Thealoz Duo Gel / Thealose	Théa	UK/EU; NHS-listed	<u>Thealoz Duo Gel claimed 0.15%, measured 0.15% (recovery 97%); Thealose claimed 0.15%, measured 0.15% (recovery 102%)</u>	<u>Thealoz Duo 10 mL bottle; Duo Gel 30 x 0.4 g single-dose units</u>	Trehalose + HA	Dry-eye lubrication/osmoprotection	Level IV	Thealoz Duo £9.12 = USD 12.35 ; Duo Gel £7.06 = USD 9.56 [ASP], Sep 2026 (NHS Drug Tariff)
Artelac Rebalance	Bausch & Lomb	UK/EU; NHS-listed	<u>Claimed 0.15%, measured 0.15% (recovery 102%)</u>	<u>10 mL bottle</u>	Vitamin B12-containing formulation (per brand; not stated in the sources examined)	Dry-eye lubrication	Level IV	£4.00 = USD 5.42 [ASP], Sep 2026 (NHS Drug Tariff)
Optive Fusion	AbbVie	UK/EU; NHS-listed	<u>Claimed 0.10%, measured 0.08% (recovery 79%)</u>	<u>10 mL bottle</u>	Carboxymethylcellulose + osmoprotectants (per brand)	Dry-eye lubrication	Level IV — lowest measured/claimed recovery (79%) in the 37-product analysis (source)	£7.49 = USD 10.15 [ASP], Sep 2026 (NHS Drug Tariff)
Systane Hydration	Alcon	EU	<u>HA concentration not claimed on the label but measured at 0.28%</u>	n.a.	Propylene-glycol-based formulation (per brand)	Dry-eye lubrication	Level IV — label-claim/measurement discordance	n.a.
Blink Intensive Tears	n.a.	UK; NHS-listed	n.a. (concentration not stated in the tariff)	<u>10 mL bottle or 20 x 0.4 mL single-dose units</u>	n.a.	Dry-eye lubrication	Level IV	£2.97 = USD 4.02 [ASP], Sep 2026 (NHS Drug Tariff)

Other NHS-listed HA eye drops (supplemental) — Aactive HA 0.1/0.2/PF, AaqEye HA 0.1/0.2%, Aeon Protect, Aeon Protect Plus, Aeon Repair, AquaVista 0.4%, AquaVista Ultra, Clinitas 0.2/0.4%, Clinitas Multi 0.2/0.4%, ClinOptic HA 0.1/0.21/0.4%, Evolve HA 0.2%, Evolve Revive, Eyeaze 0.1/0.2/0.4%, Eyeaze Lyte 0.1/0.2/0.3%, Eyeaze Pro, Eyezin XL, Hy-Opti 0.1/0.2%, HydraMed 0.2%, HydraMed Forte 0.4%, iGel 0.2%, Kent Pharma 0.2%, Ocufresh Everyday 0.2%, Ocufresh Intense Relief 0.4%, Ocu-Lube HA 0.1/0.2%, Ocusan, Oftaax, OnEye HA 0.1/0.15%, Optive Advance, Oxyal, PF Drops 0.15/0.4%, Trehapan, Viscotears HA, Viscotears Tri Action, VisuXL, VIZhyal 0.1/0.2/0.4%, Xailin Ectoine, Xailin HA, Xailin Intense 0.3%, Xailin Plus 0.2%, Xailin Tears 0.1%	Various	UK; all listed in Part IXA	Concentrations as printed in the tariff listing	<u>10 ml bottles or single-dose units as listed</u>	Various	Dry-eye lubrication	Level IV	Basic prices range from <u>£3.36 (Aactive HA 0.2%) to £10.30 (VisuXL)</u> = USD 4.55–13.95 [ASP], Sep 2026
HA eye ointments: AquaNocte, eyenite	n.a.	UK; NHS-listed under "Eye Ointment — Sodium Hyaluronate"	n.a.	<u>5 g tube</u>	n.a.	Nocturnal ocular lubrication	Level IV	£6.99 = USD 9.47 each [ASP], Sep 2026 (<u>NHS Drug Tariff</u>)

Appendix Table S8. Wound care and dermatological topical products

Product/brand	Manufacturer	Geography / regulatory status	HA source	Conc/ dose	Pack	MW	Formulation / additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class
Hyalomatrix (Hyalomatrix PA)	Fidia Advanced Biopolymers Srl (now Anika Therapeutics)	USA — FDA 510(k) K073251, cleared 14 December 2007, product code FRQ, predicate Hyalomatrix KC (Laser skin)	Esterified HA	Non-woven pad entirely composed of HYAFF-11, a benzyl ester of hyaluronic acid, with a semipermeable silicone membrane	Single-use sterile bilayer sheet	n.a.	Silicone outer membrane controls water-vapour loss and adds tear strength; HYAFF-11 layer acts as a scaffold for cellular invasion and capillary growth	Management of partial and full-thickness wounds, second-degree burns, pressure/venous/diabetic/chronic vascular ulcers, tunnelled wounds, surgical wounds (donor sites/grafts, post-Mohs, post-laser, podiatric, dehiscence), trauma wounds and draining wounds; one-time use	Level IV in the source examined (510(k) substantial equivalence; product description claims scaffold function)	2018 Class 2 recall: products susceptible to degradation from decomposition of the PVA component	n.a.	PU (scaffold/dressing); DR unestablished
BIONECT Cream / Gel (hyaluronate sodium 0.2%)	Fidia Farmaceutici S.p.A. , Italy; distributed in the US by EPI Health, LLC	USA — prescription medical device cleared via premarket notification K963004	Natural fermentation process	0.2% ("0.2 g in 1 g")	Tubes; the 25 g 0.2% presentation is the most common version priced by GoodRx	n.a.	Polyethylene glycol 400 monostearate, decyloleate, emulsifying wax, glycerol, sorbitol 70%, sodium dehydroacetate, methylparaben and other excipients	Dressing and management of partial-to-full-thickness dermal ulcers (pressure sores, venous stasis, arterial, diabetic) and wounds including cuts; clean/disinfect and debride where appropriate before application	Level IV (device labelling)	Contraindicated in known hypersensitivity; must not be used with quaternary ammonium disinfectants because HA precipitates	Average retail USD 200.75 per 25 g tube; GoodRx price USD 150.59; lowest listed USD 143.59 [CASH]; coupon prices last updated 16 May 2026 (GoodRx)	PU; DR unestablished

ialuset cream / ialuset impregnated dressing	IBSA Pharma SAS, Antibes, France	France/EU — medical device, CE marking 1999	Biofermentation	Cream: hyaluronic acid sodium salt 0.2%; sterile dressing impregnated with 0.05% HA cream	Cream tube and impregnated sterile dressing preparations	n.a.	Cetearyl glucoside, decyl oleate, cetearyl alcohol, sodium lauryl sulfate /cetearyl sulfate (cream); macrogol, glycerol, water (dressing)	Wound healing (per device leaflet) (source)	Level IV in the source examined	Two different HA concentrations across the two presentations — do not merge	n.a. (no defensible current USD price found; French reimbursement price not retrieved)	PU; DR unestablished
Hyiodine (HA–iodine complex)	Contiparo, a.s., Czech Republic	Czech Republic/EU (regulatory status not stated in the source publication)	n.a.	High-molecular-weight hyaluronic acid 1.5%, potassium iodide 0.15%, iodine 0.1%	n.a.	High molecular weight (numerical value not stated)	Viscous HA–iodine complex fluid dressing (composition)	Hard-to-heal wounds of various aetiologies including diabetic foot ulcers	Level II–III: clinical efficacy evaluation in hard-to-heal wounds (Pharmaceutics 2023)	Iodine co-formulation — effects not attributable to HA alone	n.a.	PU; DR unestablished
Hydromol Relief Cream	n.a.	UK — NHS Drug Tariff Part IX listing under "Preparations containing Sodium Hyaluronate"	n.a.	n.a.	100 mL	n.a.	n.a.	Emollient containing sodium hyaluronate (tariff category)	Level IV	Documentation limited to the reimbursement listing	£9.00 = USD 12.19 per 100 mL [ASP], Sep 2026 (NHS Drug Tariff)	PU; DR unestablished
Xclair	n.a.	UK — NHS Drug Tariff Part IX listing under "Preparations containing Sodium Hyaluronate"	n.a.	n.a.	50 g	n.a.	n.a.	HA-containing topical preparation (radiodermatitis/dermatitis positioning not stated in the tariff)	Level IV	Documentation limited to the reimbursement listing	£17.00 = USD 23.03 per 50 g [ASP], Sep 2026 (NHS Drug Tariff)	PU; DR unestablished

Appendix Table S9. Urology: intravesical instillations

Class for every row: PU (glycosaminoglycan-layer replacement); DR unestablished.

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Product/brand	Manufacturer	Geography / regulatory status	Conc/dose	Pack	Additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)
Hyacyst 40 mg and 120 mg	Istem Medikal, Ankara, Turkey (manufacturer); UK distributor Syner-Med	UK/EU — CE number under MDD 93/42/EEC; NHS-listed appliance	40 mg per 50 mL syringe (HYC-4050) and 120 mg per 50 mL syringe (HYC-1250)	50 mL pre-filled syringe	Highly purified non-animal HA	Intravesical instillation, including chemotherapy-induced cystitis	Level IV in the sources examined (IFU/technical sheet)	Instillation therapy requires catheterisation; no product-specific randomised trial identified	£70.00 per 50 mL syringe (both strengths) = USD 94.82 [ASP — NHS basic price], Sep 2026 (NHS Drug Tariff); dm+d indicative price 7000 pence since 1 January 2016 (NHS dm+d)
Cystistat	Mylan Institutional, Inverin, Co. Galway, Ireland	Ireland/EU	40 mg per 50 mL vial	1 × 50 mL vial	n.a.	Temporary replacement of the bladder glycosaminoglycan layer; instil after emptying residual urine and retain as long as possible; for cystitis, weekly for 4–12 weeks then monthly until symptoms resolve	Level IV (labeling)	Contraindicated in hypersensitivity; discouraged in children, pregnancy and breastfeeding owing to absent clinical data	n.a. (not listed in the September 2026 NHS tariff HA bladder-instillation section)
iAluRil / iAluRil Prefill	IBSA, Lodi, Italy	Italy/EU; NHS-listed appliance	800 mg sodium hyaluronate + 1 g sodium chondroitin sulfate per 50 mL	50 mL unit	Chondroitin sulfate	Intravesical instillation; studied for prevention of radiation-induced cystitis	Level I: MISTIC randomised controlled multicentre trial of intravesical HA–chondroitin sulfate for prevention of radio-induced cystitis (Redorta 2021)	Combination product — effects not attributable to HA alone	£88.00 per 50 mL = USD 119.20 [ASP — NHS basic price], Sep 2026 (NHS Drug Tariff)
EasyCyst	n.a.	UK — NHS-listed appliance	100 mg sodium hyaluronate per 50 mL	50 mL	n.a.	Intravesical instillation (tariff category)	None product-specific identified	Documentation limited to the reimbursement listing	£40.00 = USD 54.18 per 50 mL [ASP], Sep 2026 (NHS Drug Tariff)
Instylan	n.a.	UK — NHS-listed appliance	80 mg sodium hyaluronate per 50 mL	50 mL	n.a.	Intravesical instillation	None product-specific identified	Documentation limited to the reimbursement listing	£48.57 = USD 65.79 per 50 mL [ASP], Sep 2026 (NHS Drug Tariff)

Solutum	n.a.	UK — NHS-listed appliance	40 mg sodium hyaluronate per 20 mL pre-filled syringe	20 mL	n.a.	Intravesical instillation	None product-specific identified	Higher concentration per mL than 50 mL products; documentation limited to the tariff	£57.00 = USD 77.21 per 20 mL [ASP], Sep 2026 (NHS Drug Tariff)
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Appendix Table S10. Gynaecology, vulvovaginal health and intrauterine adhesion prevention

Product /brand	Manufacturer	Geography / regulatory status	Conc/dose	Pack	Additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class
HyalogYN Vaginal Hydrating Gel	Fidia Farmaceutici S.p.A.	USA — FDA 510(k) K150883 (2015), product code NUC, personal lubricant/vaginal moisturiser; earlier clearance K094039 (2010) and suppository clearance K191052 (2020)	n.a. (concentration not stated)	Gel presentation	Hyaluronic acid manufactured by bacterial fermentation, with propylene glycol, a carbomer, preservatives and sodium hydroxide for pH	Non-hormonal vaginal moisturiser to hydrate and lubricate the vaginal epithelium	Level IV (510(k) file)	Moisturisation claim only; no structural endpoint	n.a.	PU; DR unestablished
Hyaluronic Acid Vaginal Suppository (HA 5 mg / HA 10 mg)	Hudi Pharma Srl, Milan, Italy	USA — FDA 510(k) K260007 cleared 1 April 2026, OTC personal-lubricant suppository, product code NUC	5 mg or 10 mg hyaluronic acid sodium salt per 1.8 g suppository	1.8 g suppositories, individually blistered, 10 per carton (two strips of five)	Vitamin E, cocoa butter, semi-synthetic glycerides	Vaginal lubricant for over-the-counter use	Level IV (substantial equivalence)	Newest US HA clearance identified in this search; non-sterile blister packaging	n.a.	PU; DR unestablished

Hyalofemme	n.a.	UK — NHS Drug Tariff Part IX listing among vaginal moisturisers	n.a.	30 g tube	n.a.	Vaginal moisturiser/ lubricant	None product-specific identified	Documentation limited to the reimbursement listing	£4.96 = USD 6.72 per 30 g tube [ASP], Sep 2026 (NHS Drug Tariff)	PU; DR unestablished
Desirial	Laboratoires VIVACY, Archamps, France	France/EU — class III medical device, CE 0499	Cross-linked IPN-Like hyaluronic acid 19 mg/g	Total injected volume 0.5–1 mL in the study	IPN-Like cross-linking (agent not stated)	Intramucosal injection for bio-stimulation and rehydration of the superficial layers of genital mucous membranes	Level II–III: prospective bi-centric pilot study of multipoint intramucosal injection in vulvovaginal atrophy — total vaginal mucosal thickness 213.65 vs 212.33, p = 0.5949	Important: the mucosal-thickness endpoint was not significantly changed, so "bio-stimulation" is not supported by that structural measure (data)	n.a.	VB; DR unestablished

HyaReg en Gel (new cross- linked hyaluro nan / NCH gel)	<u>BioRege n Biomedi cal (Changz hou) Co., Ltd., Jiangsu, China</u>	<u>Approved outside the United States</u>	<u>Cross- linked hyaluro nan gel; concent ration not stated</u>	<u>160 mL instilled in the laparosc opic trial; 40 mL in an endome triosis study</u>	Cross- linked hyaluro nan only	<u>Absorbable anti- adhesion barrier for the abdominop elvic cavity, instilled after laparoscopi c procedures</u>	<u>Level I:</u> multicent re reviewer- blinded RCT in 216 women (215 treated, 196 per- protocol) with 160 mL gel vs 160 mL saline (<u>HyaRege n collected clinical papers</u>); <u>Liu 2015</u> RCT: no adverse events attributed to HyaRege n; Ekin 2021 pilot: significan t reductio n in dysmeno rrhoea, dyschezia ⁴ dyspareu nia and VAS scores	<u>Ekin 2021</u> <u>exact p</u> <u>values not</u> <u>stated in</u> <u>the FDA</u> <u>review</u>	n.a .	PU (barrier); DR unestab lished
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MateRe gen (HA gel for intraute rine adhesio n preventi on)	n.a. (manufa cturer not stated in the FDA review)	Ex-US (China- marketed per trial locations)	n.a.	3 mL in <u>several</u> <u>studies</u> ; <u>5 mL</u> <u>NCH gel</u> <u>in one</u>	Cross- linked hyaluro nan	<u>Prevention</u> <u>of</u> <u>intrauterine</u> <u>adhesions</u> <u>after</u> <u>hysteroscop</u> <u>y, dilation</u> <u>and</u> <u>curettage or</u> <u>miscarriage</u> ; <u>single</u> <u>administrati</u> <u>on</u>	Level I: Mao 2020 RCT (n = 306; 202 vs 104) with no adverse reactions ; Zhou 2021 double- blind RCT (n = 145) menstrua l-pattern change [87.7% (107/122) vs 76.4% (97/123), p = 0.064]; Li 2019 multicent re double- blind RCT (n = 274) with no serious adverse events (FDA HA Safety Profile)	Primary endpoints are adhesion/ menstrual outcomes, not tissue regeneratio n	n.a. .	PU (barrier); DR unestab lished
ABT131 07 (thermo - responsi ve HA sol-gel)	<u>Medyto</u> <u>x Inc.,</u> <u>Ochang</u> <u>/ Seoul,</u> <u>South</u> <u>Korea</u>	South Korea — investigat ional in the source trial	n.a.	n.a.	<u>Thermo</u> <u>-</u> <u>respons</u> <u>ive HA</u> <u>sol-gel</u> <u>anti-</u> <u>adhesiv</u> <u>e</u> <u>barrier</u>	<u>Prevention</u> <u>of</u> <u>intrauterine</u> <u>adhesions</u> <u>after</u> <u>hysteroscop</u> <u>ic surgery</u>	Level I: randomis ed non- inferiorit y trial vs an HA/CMC comparat or (Lee 2020)	Investigatio nal status — belongs in the experiment al section, not the marketed- product tables	n.a. .	PU (experi mental barrier); DR unestab lished

Appendix Table S11. Anorectal and urologic bulking agents built on stabilised HA

Product/brand	Manufacturer	Geography / regulatory status	Conc/dose	Pack	Additives	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class

Solesta	Oceana Therapeutics, Inc. at approval; now marketed by Palette Life Sciences	USA — FDA PMA P100014 approved 27 May 2011; approved in the EU November 2006 and in Canada April 2007; marketed in Austria, Denmark, Finland, Germany, Ireland, Italy, Norway, Spain, Sweden, Switzerland and the UK; never withdrawn	Dextranomer microspheres 50 mg/mL + stabilised sodium hyaluronate 15 mg/mL in phosphate-buffered 0.9% saline	Carton of four 1 mL glass syringes with five 21 G x 4½" (0.80 x 120 mm) sterile needles	Dextranomer microspheres	Treatment of fecal incontinence in patients 18 years and older who have failed conservative therapy	Level I: international multicentre double-blind sham-controlled RCT (n = 206; 136 active vs 70 sham) with Responder50 at 6 months and Responder25 at 12 months as co-requirements for success (SSED); NASHA Dx trial adverse events: proctalgia 14% vs 3%, fever 8% vs 0%, rectal haemorrhage 7% vs 1%, plus one prostatic and one rectal abscess	Contraindicated with active IBD, immunodeficiency/immunosuppression, prior pelvic radiotherapy, significant rectal prolapse, active anorectal infection/abscess/fissure, rectocele, rectal varices, HA allergy or an existing anorectal implant; late events after 6 months included proctalgia, anal prolapse and possible device dislocation	USD 754.49–1,005.99 per 4-syringe treatment, 2024 Medicare unadjusted allowed amount under the DME fee schedule (varies by geography) [ASP], 2024 (Solesta 2024 Reimbursement Guide)	PU (bulking); DR unestablished
Deflux	Palette Life Sciences (current PMA holder of record)	USA — PMA P000029, originally approved September 2001, with supplements through 31 May 2024	Exactly the same composition as Solesta (dextranomer 50 mg/mL + stabilised sodium hyaluronate 15 mg/mL)	n.a.	Dextranomer microspheres	Treatment of children with vesicoureteral reflux grades II–IV	Level I (platform): the Solesta SSED documents Deflux's earlier approval and identical composition (source)	Paediatric endoscopic injection procedure; product-specific adverse-event data not in the document examined	n.a.	PU (bulking); DR unestablished

Zuidex (dextranomer/HA urethral bulking)	n.a.	Withdrawn from the market because of concerns about high levels of pseudo-abscess formation (FDA HA Safety Profile)	n.a.	n.a.	Dextranomer HA	<u>Mid-urethral injection for female urinary incontinence</u>	Level I: randomized trial in 344 women vs bladder-neck collagen — <u>injection-site complications</u> 16% vs 0% (RR 37.78, 95% CI 2.34–610.12); <u>overall adverse events</u> 68% vs 50% (RR 1.35, 95% CI 1.10–1.64); <u>sterile abscess</u> 8.4%, <u>injection-site mass</u> 4.4%, <u>pseudocyst</u> 2.2% <u>only with Zuidex</u> ; 28 of 36 patients <u>with periurethral collections</u> <u>required secondary drainage</u>	Key withdrawal precedent for the safety narrative of the main article	n.a.	PU (historical); DR unestablished
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Appendix Table S12. Surgical adhesion barriers

Product/brand	Manufacturer	Geography / regulatory status	Composition	Pack	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price (type, date, unit)	Class
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Seprafilm Adhesion Barrier	<u>Baxter Healthcare Corporation (originally Genzyme)</u>	USA — FDA PMA P950034 with supplements through 19 December 2024; marketed in Australia and New Zealand (regional brochure)	<u>Sterile bioresorbable translucent membrane of two chemically modified anionic polysaccharides — sodium hyaluronate and carboxymethylcellulose; absorbed in 7 days in one study</u>	<u>Sheets; studies used 12.7 × 14.7 cm and four 12.7 × 15.2 cm sheets; 5" × 6" (13 × 15 cm) single sheets commercially</u>	<u>Adjunct in abdominal and pelvic surgery to reduce the incidence, extent and severity of postoperative adhesions at the site of placement and to reduce adhesive small-bowel obstruction</u>	Level I: systematic review of 13 RCTs (3,665 patients) — small-bowel obstruction [3.0% vs 5.9% (RR 0.53, 95% CI 0.38–0.73, p = 0.0001)] but anastomotic leak [3.1% vs 1.6% (RR 1.85, 95% CI 1.15–3.00, p = 0.01)]; pooled RR for postoperative small-bowel obstruction [0.45 (95% CI 0.34–0.60, p < 0.00001)] across 9 controlled trials with 4,351 patients (FDA HA Safety Profile)	Increased anastomotic-leak signal (above); regulatory event: 15 March 2024 recall — "Product was distributed in the United States without proper regulatory approval"; earlier sterility recalls in 2008 and 2012 (same source)	USD 110.00 per single 5" × 6" sheet [DIST], accessed 9 Sep 2026 (Surgical MS)	PU; DR unestablished
Guardix-sol	<u>Hanmi Medicare, Seoul, South Korea</u>	South Korea (regulatory details not stated)	<u>HA plus carboxymethylcellulose gel</u>	<u>5 g used in a colorectal-surgery study</u>	<u>Adhesion barrier in laparoscopic radical cystectomy, colorectal surgery and other procedures; single administration</u>	Level I: RCT (n = 76) with adhesive bowel obstruction in 0 vs 6 control patients, p = 0.025; three-arm RCT (n = 488) — overall complications 12.9% <u>Guardix vs 15.5% Seprafilm vs 18.7% control, p = 0.533</u>	Comparative complication differences were not statistically significant in the three-arm trial (source)	n.a.	PU; DR unestablished

Appendix Table S13. Ear, nose and throat, sinonasal and middle-ear products

Product/brand	Manufacturer	Geography / regulatory status	Composition	Pack	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price	Class
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MeroGel / MeroGel Injectable	Medtronic (product page publisher)	EU/international (regulatory identifiers not stated on the product page)	Bioresorbable woven fleece of esterified hyaluronic acid; described in the FDA review as an esterified hyaluronan derivative	Two pieces of approximately 0.5 x 0.5 x 0.2 cm³ in a tympanoplasty study; absorbed within 2 weeks	Nasal packing/sinus stent after functional endoscopic sinus surgery, used dry or hydrated, to help prevent adhesions and middle-turbinate lateralisation; also used as middle-ear packing in tympanoplasty	Level I: RCT in 205 tympanoplasty patients (72 MeroGel, 64 cartilage, 69 combined) with no reoperation or sensorineural hearing loss and no significant difference in re-otorrhoea or prosthesis extrusion; RCT of 112 vs 115 patients in endonasal endoscopic dacryocystorhinostomy with no MeroGel-related adverse events (FDA HA Safety Profile)	No product-related adverse events reported in the cited studies	n.a.	PU; DR unestablished
Sepragel (Sepragel Sinus)	n.a.	Ex-/US market history not stated in the review examined	Contains HA; other details not stated	n.a.	Nasal packing after endoscopic sinus surgery; single administration	Level I (pooled): included in a systematic review of 4 RCTs with 352 patients; no adverse events or complications reported in 2 of the included trials	Adverse events not stated	n.a.	PU; DR unestablished
PureRegen Gel Sinus	n.a.	Ex-US	Absorbable cross-linked HA hydrogel	2 mL; two applications, the second 2 days after surgery; 7-day treatment duration	Nasal dressing after bilateral endoscopic sinus surgery	Level I: side-randomised RCT in 55 patients (PureRegen + gelatin sponge + MeroGel vs gelatin sponge + MeroGel) with no treatment-related adverse events and reported reductions in postoperative synechiae, oedema, crusting and mild mucopurulent drainage (Shi 2013, cited by FDA)	Small single-centre trial	n.a.	PU; DR unestablished

Appendix Table S14. Dental and periodontal products

Product/brand	Manufacturer	Geography / regulatory status	Composition	Pack	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price	Class

Gengigel	n.a. (manufacturer not stated in the FDA review)	Ex-US markets	0.2% HA in one study; 0.8% HA gel in another	1 mL of 0.8% gel per subgingival application in one study	Oral periodontal/gingival application — single subgingival application, or twice-daily topical application for 21 days	Level I: split-mouth RCT in 24 patients with moderate-to-severe chronic periodontitis (1 mL of 0.8% gel, 12 weeks) with no adverse events; split-mouth crossover RCT in 28 patients with plaque-induced gingivitis — reduction in inflammatory infiltrate 50% with scaling plus topical HA, 44% scaling alone, 33.34% topical plus intrasulcular HA, 16.67% topical HA alone	No adverse events reported in either trial	n.a.	PU/SV (adjunct to scaling); DR unestablished
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Appendix Table S15. Cartilage repair and orthobiologic scaffolds or composites

Product/brand	Manufacturer	Geography / regulatory status	Composition	Indication & regimen	Strongest product-specific human evidence (level)	Adverse effects / limitations	Price	Class
Hyalofast (marketed ex-US; US pre-market)	Anika Therapeutics	CE-marked and approved as a biodegradable support for entrapment of mesenchymal stem cells for repair of chondral or osteochondral lesions; marketed in over 35 countries with more than 35,000 patients treated since 2009; FDA Breakthrough Device Designation; third and final PMA module filed with FDA on 31 October 2025 after mixed Phase III (FastTRACK) results	Made entirely from Hyaff, a benzyl ester of hyaluronic acid	Single-stage cartilage repair, used with bone-marrow aspirate concentrate or after bone-marrow stimulation/microfracture; acts as a chondroprotective layer retaining mesenchymal stem cells	Level II: non-randomised comparative studies — 21 Hyalofast vs 25 BST-CarGel knees at 24 months with oedema or cyst formation in 8 (38%) vs 10 (40%); 19 Hyalofast vs 24 microfracture patients at 25.7 ± 2.5 months with persistent pain and early degenerative change in 1 vs 2 patients. Level I: US pivotal FastTRACK Phase III reported as mixed (company/pres reporting)	Comparative evidence is non-randomised; the pivotal randomized result is described as mixed and the device is not yet FDA-approved (status); the evidence does not support presenting "hyaline-like cartilage regeneration" as established	n.a.	SV/PU with regenerative intent; DR unestablished (no human structural-restoration endpoint met in the examined evidence)

Chondrotissu e	BioTissue AG	Ex-US (regulatory details not stated)	Polyglycolic acid and hyaluronan matrix	Matrix-augmented bone- marrow stimulation after microfracture for grade III/IV cartilage degradation; single administration	Level I: multicentre RCT in 24 patients (12 per arm) at 108 weeks — 1 infected haematoma and 3 mild swellings in the Chondrotissue group; 1 severe effusion in the microfracture group; no moderate or severe allergic reactions	Very small sample; composite scaffold (PGA + hyaluronan) so HA- specific attribution is impossible	n.a.	PU/SV; DR unestablishe d
Agili-C	n.a. (manufacture r not stated in the FDA review)	Ex-US/US (details not stated)	Cartilage scaffold; HA composition details not stated	Cartilage scaffold implantation	None — the FDA review states that evidence was lacking for Agili-C	Insufficiently documented as an HA product in the sources examined; supplementa l mention only	n.a.	Unclassifiable on current evidence; DR unestablishe d

S5. Alias, duplicate and exclusion register

The following names are not separate products and must not be counted, cited or compared as such. This register exists because trade-name proliferation is the single largest source of double counting in the HA literature.

Name	Determination
Sinovial 0.8%	Alias of the FDA-approved Gelsyn-3 device (both covered by premarket approval P110005) (openFDA premarket-approval record ; comparative review)
Intragel, Intragel Mini, Jointex, Jointex Starter, Jointex Mini, Yaral, Yaral Forte, Yaral Mini, Gony Alert MD, Sinovial Mini	Trade-name variants of one platform described in a single European Union summary of safety and clinical performance; cite once as an alias family (SSCP)
Hyalart, Hyalectin	Historical trade names of the Hyalgan platform (joint-by-joint brand review)
Artz, Artzal as "United States products"	Historical United States brand names of the Supartz / Supartz FX platform (product-level evidence review)
Durolane SJ	Small-joint presentation of the Durolane stabilised-HA platform, not a distinct formulation (instructions-for-use comparison)
GenVisc 850 versus Adant	Same formulation family; the United States device was approved on equivalence to the Supartz platform of which Adant is the European original (product-level evidence review)
RHA Dynamic Volume	Rename of the RHA 4 mepivacaine formulation with an added indication, not a new molecule (panel-track supplement summary)
Juvéderm ULTRA 2 / 3 / 4, ULTRA SMILE	European numbering of the Juvéderm Ultra family already tabulated in the main article (openFDA premarket-approval records)
TotalVisc, DuoVisc, Healon Duet PRO / PRO II	Co-packages of already-listed ophthalmic viscosurgical devices, not distinct formulations (StableVisc/TotalVisc summary ; formulary review)
Hylaform, Hylaform Plus, Captique, Prevelle Silk, Hydrelle/Eleveess, Juvéderm 24 HV / 30 / 30 HV	Legacy or discontinued United States fillers appearing only in historical premarket-approval trade-name records (openFDA premarket-approval records)
Cellugel, OcuCoat	Hydroxypropylmethylcellulose ophthalmic viscosurgical devices — not hyaluronic acid (formulary review)
Gepan Instill	Chondroitin-sulfate-only bladder instillation — not a hyaluronic acid product (Drug Tariff Part IX)
Tactoset as an "HA therapy"	Hyaluronic acid is an excipient in a settable calcium-phosphate bone substitute; listed only as a platform-utility example (S10(k) summary)

S6. Documented conflicts between sources

Conflicts are preserved rather than reconciled, because merging incompatible values would create a specification that no document supports.

Item	Conflict
Fermathron S	A comparative review and the manufacturer brochure differ on cross-linking status and molecular weight; both values are shown in Appendix Table S1 with their own sources
Euflexxa molecular weight	Published as 24,000–3,600 kDa in one comparative review and 2,400–3,600 kDa in others; the lower range is arithmetically coherent, but the discrepancy is recorded rather than silently corrected
Kartilage Cross	Named as a cross-linked product yet listed as non-cross-linked in the instructions-for-use comparison
Stylage range	Concentrations printed in mg/dL in one source and mg/mL in others; only the source's own unit is reproduced

S7. Coverage, limitations and how this appendix should be used

This register is broad but not exhaustive, and it is not a systematic review. Products enter it only when at least one primary document states their identity and specifications; several additional brands encountered in secondary or commercial listings were excluded because no qualifying primary document could be obtained, and their absence here is not evidence that they do not exist or do not work. Specifications for products marketed outside the United States derive from labels, summaries of product characteristics and regulatory summaries rather than from independent measurement. Prices are point-in-time values of differing type and vintage, and currency conversions rest on a single day's reference rate.

Used correctly, the appendix supports three tasks: identifying the exact product behind a published result; checking whether a marketing claim matches the evidence class its own documentation supports; and comparing prices only within a single price type. Used incorrectly — as a ranking, a formulary or a claim of equivalence between rows — it would reproduce the conflation this work exists to prevent.