Table 1: Treatment Considerations for Pediatric Psoriasis			
Type of therapy	**FDA approved for pediatric psoriasis?**	**Notes**	**Side effects (brief)**
Topicals:			
Corticosteroids	No, but recommended by expert consensus as an off-label therapy Data for halobetasol foam in 12-17yo as well as data for halobetasol+tazarotene	Not a standard one size fits all approach Considerations: -ultra high potency topical corticosteroids as monotherapy for short term treatment of localized psoriasis -combined betamethasone+calcipotriol: Ointment: use once daily, up to 4 weeks at a time, in 12yo or older Suspension: once daily for up to 8 weeks for 12yo and older on the scalp	Steroid atrophy, striae, easy bruising, telangiectasias, acne, burning/stinging Systemic absorption/HPA axis suppression (esp. <12yo) Avoid use of ultra-high-potency topical corticosteroids on the face, body folds, genitalia of infants and children
Topical Calcineurin inhibitors: Tacrolimus Pimecrolimus	No (it is approved for atopic dermatitis 2yrs and older)	First line therapy for psoriasis of the face, genitalia, and body folds	Burning, stinging, pruritus, irritation (theoretical risk lymphoma- from transplant patients on systemic doses, high doses in animals, in atopic dermatitis patients there were no reported cases of lymphoma)
Vitamin D analogues: Calcipotriene Calcipotriol Calcitriol	Yes	Use in combination or rotation with topical corticosteroids Consider mixing calciptriene+ultra-potent topical CS BID for 2 weeks, then reduce to Calcipotriene on the weekdays, and corticosteroid on the weekends Work by inhibiting keratinocyte proliferation, promote differentiation	Irritation, emollients can reduce irritation Theoretical risk of hypercalcemia and hypovitaminosis D from systemic absorption (recommend <80g/week on the scalp for adolescents)
Tar-based therapies	OTC: approved under the FDA classification as GRASE "generally recognized as safe and effective"	Consider as a part of rotational therapy with Vitamin D analogues, topical calcineurin inhibitors, topical corticosteroids as a means of utilizing steroid-sparing agents	Irritation, xerosis, increased sensitivity to the sun/phototherapy, stains clothing
Tazarotene	No- but data available for halobetasol proprionate+tazarotene in 12-17yo FDA approved for adults	Can use as monotherapy or in combination with topical corticosteroids	Burning, pruritus, erythema Teratogenic: NOT for pregnant individuals, extreme caution in those who can become pregnant
Anthralin	Yes: stable plaque psoriasis of the skin and scalp	Also known as dithranol, natural quinone; derivative of araroba tree in Brazil Normalizes the rate of cell proliferation and keratinization by reducing mitotic activity Need long term use >12w, recommend short contact therapy <2hrs then rinse off	Burning, stinging, peri-lesional erythema Pruritus, staining of clothes (red-brown color)
Phototherapy			
NBUVB PUVA		Narrow Band UVB PUVA May be beneficial for guttate, thin plaques Consider pre-treatment with mineral oil to increase efficacy and reduce dosage needed	Burning, dry skin, erythema, blistering, hyperpigmentation, pruritus, viral reactivation, cutaneous carcinogenesis with long term PUVA (PUVA NOT for <12yo) Feasibility of frequent office visits/home phototherapy (start 3X per week then reduce to 2X after improvement) Use eye protection

			NOT for generalized erythroderma or cutaneous cancer syndromes, caution with numerous atypical nevi
Systemic, non-biologics:			
Methotrexate	No Approved for psoriasis in adults	0.2-0.7mg/kg/week PO or SC (max 25mg weekly), if >13yo may dose similarly to adults **Okay to crush tablets, liquid can be swallowed (vs SC injection, SC offers better bioavailability and less GI upset)** Good for arthritis, inexpensive, long-term efficacy, and safety data May prevent anti-drug antibodies to biologics when given concomitantly with them May need >6mo to determine efficacy, consider taper after 2-3mo of sustained clearance	GI upset, fatigue, bone marrow suppression (occurs usually at 4-6w), hepatotoxicity, infection, mood changes, pulmonary toxicity, mucositis Folic acid 1mg qd 6 days/wk decreases GI upset and hepatic AE Contraindication: pregnancy category X Caution: Renal or hepatic impairment, medication interactions, obesity, diabetes Labs: CBC, hepatic function (monthly for 3mo then ever 3-6mo), creatinine, HIV/Hepatitis A,B,C/TB If considering test dose: give 1.25-5mg once, then check CBC 5 or 6 days later (NSAIDS and TMP/SMX may increase toxicity)
Acitretin	No Approved for psoriasis in adults	Non-immunosuppressive, regulates inflammation and keratinocyte turnover 0.1 to 1mg/kg/day May help guttate, pustular, palmoplantar psoriasis May be used with phototherapy (NBUVB) to reduce the dose of both	Dry skin, dry mucous membranes, hyperlipidemia, bony changes/hyperostosis, mood changes Teratogenicity (re-esterified to etretinate in the presence of alcohol, stored in the body for up to 3 years). Individuals who can become pregnant need to wait 3 years prior to conceiving after stopping this medication Labs: CBC, fasting lipids, hepatic function, pregnancy test. Check LFTs/lipids 1mo after start/dosing changes, monthly pregnancy test Bone imaging if symptoms/extended length of tx Don't take >5000IU vitamin A daily
Cyclosporine	No Approved for psoriasis in adults	Rapid rescue of severe/unstable/erythrodermic/pustular psoriasis Dosing 2-5mg/kg/day divided BID, available as a microemulsion Inhibits immunocompetent T lymphocytes, decrease IL-2 and IFN-gamma See response at 2-8 weeks; gradually taper after stable for 1-2months (while transitioning to an alternate medication) Note: moderate CYP3A4 inhibitor (caution medication interactions)	Hypertension, renal toxicity-vasoconstriction of renal afferent arterioles, immunosuppression, hypertriglyceridemia, electrolyte abnormalities (Mg, K, uric acid), increased cutaneous carcinoma (nonmelanoma)-esp. with phototherapy. Less common: hypertrichosis, paresthesia, headache, GI upset, arthralgias, gingival hyperplasia, lymphoproliferative malignancies **NO live vaccines while on therapy** Check BP weekly for first month, then monthly Labs: CBC, creatinine, BUN, uric acid, K, lipids q2w for first month, then monthly
Biologics:			
Etanercept (TNF-α inhibitor)	Yes (4 years and older for plaque psoriasis)	0.8mg/kg/weekly (max 50mg weekly) Week 12: 57% reached PASI 75 or greater	Infections, malignancy, lymphomas, new onset, or exacerbation of demyelinating

			disorders, worsening of congestive heart failure, myelosuppression,
Ixekizumab (IL-17A inhibitor)	Yes 6 years and older for plaque psoriasis	<25kg: 40mg at week 0, 20mg every 4 weeks 25-50kg: 80mg week 0, 40mg every 4 weeks >50kg: 160mg week 0, then 80mg every 4 weeks Week 12: 78% reached PASI 90	Infection, tinea/candida, URI, injection site reaction, nausea Caution: increased incidence of IBD onset or flare
Secukinumab (IL-17A inhibitor)	Yes 2 years for PsA (arthritis) 6 years and older (plaque psoriasis)	Plaque and PsA psoriasis: dosing weeks 0,1,2,3,4 then every 4 weeks 15-50kg, 75mg dose >50kg, 150mg dose Week 12 (low dose): 69% PASI 90, 88% by week 24, 30% PASI 100	Nasopharyngitis, diarrhea, URI, increased incidence/flare IBD Caution: increased incidence of IBD onset or flare
Ustekinumab (IL 12/23 p40 unit inhibitor)	Yes 6 years and older for plaque psoriasis	Week 0,4, then every 12 weeks: 0.75mg/kg (<60kg), 45mg (60-100kg), 90mg (>100kg) Lowest # of injections for pediatric patients (2starter doses, then 4X a year) Of note: higher rates of PASI 90 in IL-17 and 23 inhibitors compared to ustekinumab (70-78% vs 64%)	Injection site pain, fatigue, infection, URI, headache
Others: -Risankizumab -Gulsekumab -Tildrakizumab -Brodalumab -Certolizumab pegol -infliximab -adalimumab	No	Data collection ongoing	
Newer medications:			
JAK and TYK inhibitors: Tofacitinib Baricitinib Deucravacitinib	Tofacitinib FDA approved for PsA in adults	Tofacitinib 5-10mg BID IL-23 receptor relies on a heterodimer of JAK2/TYK2 for signal transduction	Hyperlipidemia, myelosuppression, zoster, increased major adverse cardiac events (death in >50yo with at least 1 cardiovascular risk factor), infection, intestinal perforation, increased risk of lymphoma/skin cancer
Tapinarof cream	No Approved for 12+ atopic dermatitis	Aryl-hydrocarbon receptor agonist (regulation of skin barrier- increased filaggrin and loricrin, reduces pro inflammatory cytokines) Tapinarof 1% cream once daily in adults: week 12 PASI 75 56%, PASI 90 40%	Contact dermatitis, Folliculitis, Application site dermatitis, miliaria, urticaria, nasopharyngitis, headache
Roflumilast cream	No Children included in adult studies	PDE-4 inhibitor, 25-300X more potent than apremilast or crisaborole Studies underway for 0.5%, 0.3%, and 0.15% creams	Erythema, application site pain, nasopharyngitis
Apremilast (oral)	No Approved for plaque psoriasis and PsA in adults Pediatric studies under way	PDE-4 inhibitor (leads to less NFKB-> less pro-inflammatory cytokines) Adults: 5-day titration then 30mg BID	Diarrhea, nausea/vomiting, depression, URI, headache, weight loss (up to 5-10% weight in ~10% patients) Don't use with CYP450 inducers (decreased efficacy of apremilast)