The need and use of biologic medicines in Australia—research into the Australian dermatology context with patient and nurse involvement in 2023.

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Abstract

Introduction: Nurses assist patients prescribed biologic medicines in assessments, safety, education, adherence and self-management. Internationally dermatology nurses play a significant role in patient care, also contributing to research and guidelines. Limited research into Australian nurses' scope and practice is shown through an ad hoc survey of nurse activity with biologic patients, workplace training. Training, employment and permitted scope limitations may impede nurse/patient interactions. This research shows current Australian data—ad hoc—of Australian Dermatology Nurses' Association (ADNA) members.

Aim: Show numbers of patients on biologic medicines, trained nurses and workflow, education needs, and scope.

Method: Part 1: Literature search Pubmed and Cochrane—result 95 papers, 12 hand searched, with duplicates and irrelevant studies removed—remaining 15 critically appraised, seven noted nurse roles. Part 2: survey to ADNA members

Results: Approximately 17.02% response 40/235 active ADNA nurse members: 37 responded 'yes' to biologics prescribed, 36 working with those patients, 29 were trained; total nurses: 80 with 65 trained—not all trained nurses utilised; sometimes exclusively dermatologists' role. Of 4431 patients on biologics, 2347 psoriasis, 1406 eczema, 307 HS and 156 urticaria, 15 clinical trial and 234 Medicare 'work-up' to qualify and 200 unknown allocation. The biologic patient average is 94.26 per reported clinic; data collected August to September 2023.

Discussion: International Research shows nurses contribute to improve patient care in inflammatory diseases; initially pioneered in Rheumatology (Candelas, et al. 2016). Some Australian nurses also work in biologic medicines, collaborating with the health care team and consumers; highly trained and intuitive, nurses adapt Australian nursing standards to the dermatology specialty. However, not all training is equal, and those with training are not always employed to use these skills. Role confusion, and outdated job descriptions limit nurses, increase wait-times, slowing workflow and unsatisfactory patient experience. Research limitations: small sample size—bias, ad hoc survey (unvalidated), limited stakeholder input. Advantages include some untapped Australian Dermatology nurse activity.

Conclusion: Internationally nurses have clear roles descriptions, participating in biologic patient care. More research is needed into Australian patient experiences and health outcomes. More nurse training programs are needed, along with self-regulation, for standardised nursing skills, increased competencies, role clarity and intentional holistic patient care.

Introduction

In Australia the question was asked "How many nurses work in biologics?", which is a fair question when conversing about education. On reflection it is clear the two are inseparable; all nursing skills begin with education, which when translated lead to role clarity, confidence, competence, outflowing to better workplace collaboration and patient benefits.

Nurses assisting patients navigating biologic medicines complements medical care by assessing safety, adherence and self-management. Internationally nurses play a significant role in patient care, also contributing to research and guidelines (Aldredge & Young, 2009; Beauvais, et al., 2022; Palmer & Miedany, 2010).

Nurses have been important in the care of patients' journey with biologics and chronic inflammatory diseases since before 2009 in the USA (Aldredge & Young, 2009) and 2010 in the UK (Palmer & Miedany, 2010), beginning with Rheumatology (Candelas, et al, 2016). Anti-tumour necrosis factor infusions have been administered by nurses well before the current research of autoinjector pens and pre-filled syringes that provide the benefit of self-management of disease in the home, with clinical safety procedures implemented for advanced practice (Beauvais, et al, 2022), including education for patients, screening bloods, prior immunisations, assessing toxicities and quality of life, with consistency to increase treatment adherence (Aldredge in Nichol, 2016; Beauvais, et al, 2022; Candelas, et al., 2016 Trettin et l., 2021).

Evidence from Both UK and USA, pooled into expert opinion, a mixed method of three phase intervention to increase adherence and a randomised controlled trial within nine French Rheumatologist clinics highlights international acceptance of specialist biologic nurses and nurse-led education programs for patients for improved safety (Aldredge & Young, 2009; Beauvais, et al., 2022; Palmer & Miedany, 2010; Trettin, et al., 2021) with long-term effective patient change. When 129 patients RA and spondylosing arthritis were randomised into education at baseline and three months compared with usual care, 122 completed, 127 analysed--intention to treat, 64 received intervention by nurses (45-60 min) at baseline and 3 months with 95% confidence intervals in higher skills within educated group (Beauvais et al, 2022). The Danish small mixed method survey/intervention for psoriasis patients: discussion and problem identification, telehealth problem-solving, and clinical implementation at review, resulted in permanent lifestyle change and biomedical improvements (Trettin, et al., 2021). However, on reflection nurses noted educational needs in motivational interviewing techniques for permanent patient behavioural changes (Chisholm, et al, 2017); a skill that is now being taught in nursing education but has been used in other nursing interventions (Speir, Johnson & Jirojwong, 2013). reflected on their need to equip themselves in this form of motivational interviewing and professionalism, and patients found the frequency inconvenient and noted nurse and doctors need to improve eye contact and being prescriptive during consultations does not improve therapeutic relationships, highlighting the need for finding a way

top naturally integrate learning over time for holistic care of patients (Trettin, et al, 2021).

Aldredge & Young (2009) and Palmer & Miedany (2010) note biologic specialist nurses manage their own patient flow from referral to continuation of care with a. They assess patients' skin, well-being, taking clinical history. They order screening tests, review results, ensure tuberculosis risks are minimised, knowing the mode of action of each medicine available and prescribed. They discuss realistic expectations, risks, side effects and monitor for them. They provide education for home use, prescription and injection self-management, empowering patients in their disease and monitor understanding and providing opportunity for followup questions by patients as they occur. Together they set realistic goals and plan care, review three monthly in the USA, where insurance once mentioned as a barrier to treatment. They provide accurate information on medicines and encourage healthy lifestyle choices, treating the whole person, emphasising long-term disease management as integrated care nurses who self-monitor, reflect on practice needs and ensure they seek appropriate relevant education to maintain capability to practice, along with developing and monitoring nursing protocols and compliance for patient safety while liaising with the medical team (Aldredge & Young, 2009; Palmer & Miedany, 2010).

Australian dermatology nurses are important to patient care—either private dermatology practices or hospitals—contributing to patient work-up to qualifying for biologics by administering phototherapy, recording disease severity, monitoring drug toxicities and escalating adverse events (Aldredge & Higham, 2018), and encouraging adherence with treatments for faster progression towards subsidised medicines (Services Australia, 2022). Once prescribed biologic medicines nurses with training capably provide immunisation pre-checking, interpret screening blood results, request continued blood monitoring, educating patients regarding drug mode of action, adverse effects and benefits, with improved self-management and reduced infection rates by utilising motivational interviewing for lifestyle/behavioural changes, increasing patient satisfaction with their disease management (Aldredge & Young, 2009; Beauvais, et al., 2022; Candelas, et al., 2021; Palmer & Miedany, 2010), ensuring they continue to receive Pharmaceutical Benefits Scheme (PBS) authority medicines (Services Australia, 2022). Policies and procedures govern clinical roles—not only education—highlighting inconsistency in nurses' scope between facilities. This research shows current Australian data through an ad hoc survey of Australian Dermatology Nurses' Association (ADNA) members with an aim to increase support of nurse education, nurse scope and collaboration for patient and workflow improvement.

Many Australian nurses have become proficient in advanced practice through intentional education in ad hoc courses, postgraduate certificates, diplomas and Masters degrees, but without consistent training in this specialty, not all nurses are sure of their role in nurse-led clinics involving biologic medicine safety and patient care. All Australian dermatology nurses should be educated in many basic dermatology skills and procedures, including care of biologic patients, with evidence-

based predictable consistency to provide continuation across the spectrum—tertiary to primary care. However, specialised training should be offered for nurse-led clinics within medically supervised facilities to ease workflow, freeing doctors to diagnose and treat patients with unstable disease.

The purpose of this paper is to show the need for more nurses working with biologic medicines and patients prescribed them for their inflammatory diseases. To enable this service specific education is needed to empower nurses, clarify their role and increase dermatology nurse scope within Australia. This enquiry begins with a question: "How many nurses work in biologics?".

Aim: Show numbers of patients on biologic medicines, nurses workflow, education needs, nurse scope. The aim of the research is to show nursing scope Internationally regarding biologic medicines, highlight dermatology nurse practice and value within Australia in this field and, gaps in education and possible nurse scope in treating and caring for patients prescribed biologic medicines, including the need for extra training in motivational interviewing as well as expert disease knowledge and medicine safety, to assist behaviour change and adult educational principles for life-long learning.

Method: Part 1: Literature search Pubmed and Cochrane—result 95 papers, 12 hand searched, with duplicates and irrelevant studies removed—remaining 15 critically appraised.

PICO question:

Is there a measurable difference in patient satisfaction, adherence and health outcomes with nurse interventions, education and therapeutic relationship for patients prescribed biologics?

P—patients prescribed biologic medicines

I—nurse education, relationship, interventions

O—improved patient satisfaction, adherence and health outcomes

Decision was made to remove the comparison "physician only care" as the research was to show complementary nurse interventions and patient improvement, not compare disciplines.

Screening: If nurse was not mentioned in the abstract it was removed as not relevant to the question.

Hand search in references were added to prevent accidental bias through imperfect database searches.

((((scope) OR (role))) AND (((nurs*) AND ((((((biologic) AND (biologic therapy)) AND (biological))) AND (((((((((patient*) AND (inflammat*)) OR (psoriasis)) OR (eczema)) OR (dermatitis)) OR (hidradenitis suppurativa)) OR (HS)) OR (urticaria)))))))) see Appendices 1

71 papers ->added 5 papers in hand search and search of references

24 trials Cochrane search

<- removed papers not relevant to nurses, scope, biologics and dermatological inflammatory disease

Search for biologic research	Numbers
Papers from search Pubmed and Cochrane	71, 24 respectively +95
Added papers by hand search and references	5, 7 respectively +12
Semi total papers	=107
Removed as irrelevant to question	-81
Removed after reading abstract (abstract only, irrelevant to Question or cost prohibitive)	-11
Remaining for critical appraisal	15
Removed after critical appraisal	-10
total	5

See appendix 3

Critical appraisal was conducting by one nurse—the researcher.

Part 2: Ad hoc survey of Australian Dermatology Nurses' Association (ADNA) members. Sent to nurse members in ad hoc email requesting their contributions—one nurse per practice to prevent duplication. All de-identified data. Some answers were qualitative in experience and provided estimations which were averaged. All entries included, so some results simply state "no " when asked if biologics are at the clinic, or if nurses work with these, thus creating a contrast in data, but also highlighting nurse scope as limited by individual employer and doctor choice.

Results The biologic research of the Australian Dermatology Nurses' Association members is seen in appendix 3. Approximately 17.02% response 40/235 active ADNA members, number of nurses per responding clinic involved 37 responded yes to having biologics at their clinic and working directly with these but only 36 had trained; 65 of 80 total nurses working with biologics are trained. Of 4431 patients on biologics, 2347 psoriasis, 1406 eczema, 307 hidradenitis suppurative (HS) and 156 chronic spontaneous urticaria (CSU), 15 more were on a clinical trial for lichen pilaris and 234 were 'working up' to qualify with 200 unknown allocation of disease. The average number of patients on biologics per clinic 111 (rounded) as of data collected between August and September 2023.

The average number 2 nurses at each practice—40 clinics responding of 235 members, required approximately 117 responses to collect all data. Eighty per cent power to reduce making a type II error in data required 47 responses; the response is underpowered (Hoffmann et al., 2017). The poor response, though rich in data might lead to skewed conclusions—extension of survey increased results by 4 responses—a longer period for data collection would have been beneficial but unlikely to have altered responses. No qualitative questions were asked to gain experiences with working with patients in biologic medicines and no other stakeholders were included in this survey, limiting accuracy.

Survey of Australian Dermatology Nurses' Association (ADNA) members into biologic medicines for inflammatory diseases in dermatology practices: Highlighting increased nurse training and scope.
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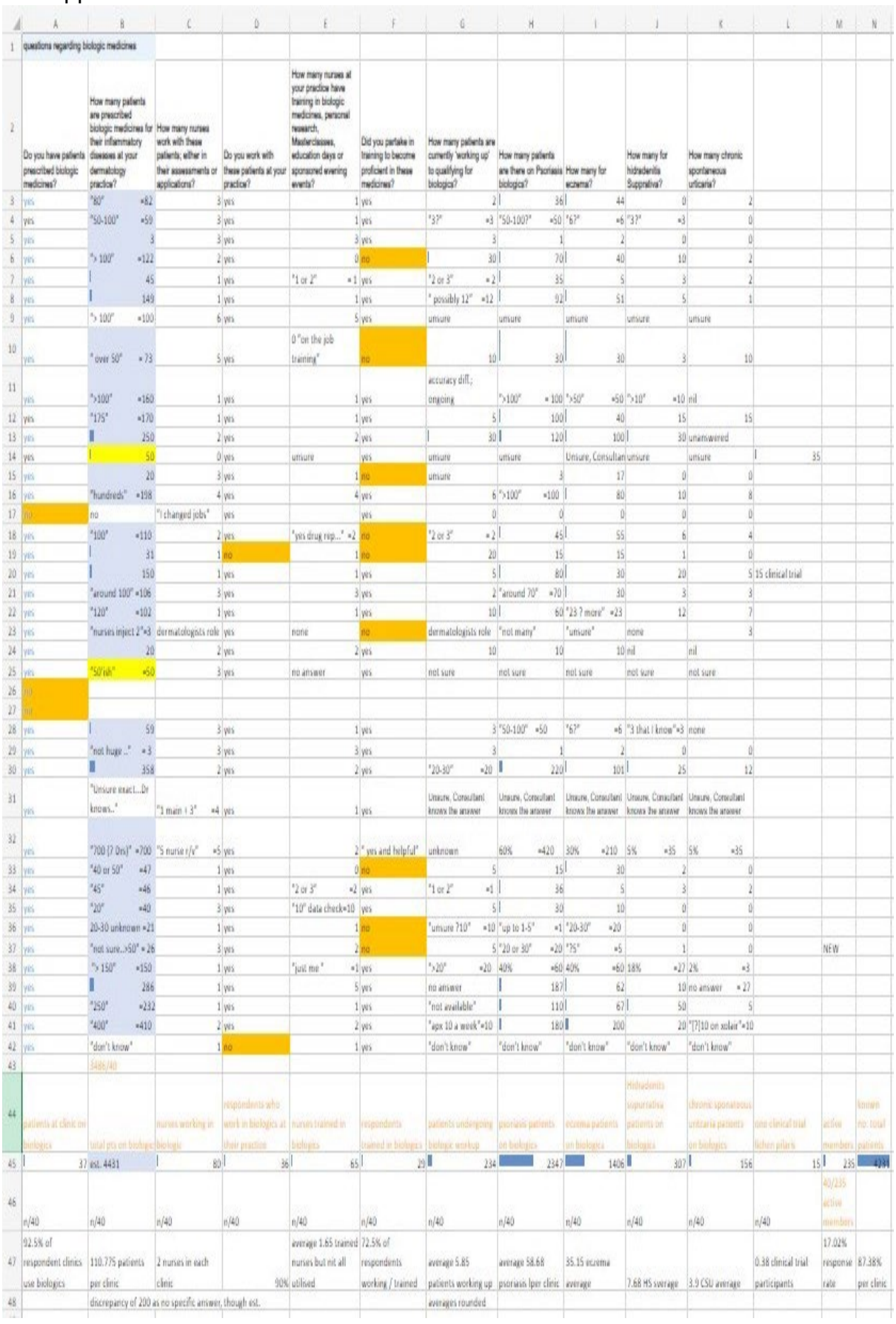
See appendix 3 for data



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	questions regarding biologic medicines													
2	Do you have patients prescribed biologic medicines?	How many patients are prescribed biologic medicines for their inflammatory diseases at your dermatology practice?	How many nurses work with these patients; either in their assessments or applications?	Do you work with these patients at your practice?	How many nurses at your practice have training in biologic medicines, personal research, Masterclasses, education days or sponsored evening events?	Did you partake in training to become proficient in these medicines?	How many patients are currently 'working up' to qualifying for biologics?	How many patients are there on Psoriasis biologics?	How many for eczema?	How many for hidradenitis Suppurativa?	How many chronic spontaneous urticaria?			
3	yes	"80" =82	3	yes	1	yes	2	36	44	0	2			
4	yes	"50-100" =59	3	yes	1	yes	"3?" =3	"50-100?" =50	"6?" =6	"3?" =3	0			
5	yes	3	3	yes	3	yes	3	1	2	0	0			
6	yes	"> 100" =122	2	yes	0	no	30	70	40	10	2			
7	yes	45	1	yes	"1 or 2" =1	yes	"2 or 3" =2	35	5	3	2			
8	yes	149	1	yes	1	yes	" possibly 12" =12	92	51	5	1			
9	yes	"> 100" =100	6	yes	5	yes	unsure	unsure	unsure	unsure	unsure			
10	yes	" over 50" = 73	5	yes	0 "on the job training"	no	10	30	30	3	10			
11	yes	">100" =160	1	yes	1	yes	accuracy diff.; ongoing	">100" = 100	">50" =50	">10" =10	nil			
12	yes	"175" =170	1	yes	1	yes	5	100	40	15	15			
13	yes	250	2	yes	2	yes	30	120	100	30	unanswered			
14	yes	50	0	yes	unsure	yes	unsure	unsure	Unsure, Consultan	unsure	unsure	35		
15	yes	20	3	yes	1	no	unsure	3	17	0	0			
16	yes	"hundreds" =198	4	yes	4	yes	6	">100" =100	80	10	8			
17	no	no	"I changed jobs"	yes		yes	0	0	0	0	0			
18	yes	"100" =110	2	yes	"yes drug rep..." =2	no	"2 or 3" =2	45	55	6	4			
19	yes	31	1	no	1	no	20	15	15	1	0			
20	yes	150	1	yes	1	yes	5	80	30	20	5	15 clinical trial		
21	yes	"around 100" =106	3	yes	3	yes	2	"around 70" =70	30	3	3			
22	yes	"120" =102	1	yes	1	yes	10	60	"23 ? more" =23	12	7			
23	yes	"nurses inject 2"=3	dermatologists role	yes	none	no	dermatologists role	"not many"	"unsure"	none	3			
24	yes	20	2	yes	2	yes	10	10	10	nil	nil			
25	yes	"50'ish" =50	3	yes	no answer	yes	not sure	not sure	not sure	not sure	not sure			
26	no													
27	no													
28	yes	59	3	yes	1	yes	3	"50-100" =50	"6?" =6	"3 that I know"=3	none			
29	yes	"not huge .." = 3	3	yes	3	yes	3	1	2	0	0			
30	yes	358	2	yes	2	yes	"20-30" =20	220	101	25	12			
31	yes	"Unsure exact...Dr knows.."	"1 main + 3" =4	yes	1	yes	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer			
32	yes	"700 (7 Drs)" =700	"5 nurse r/v" =5	yes	2	" yes and helpful"	unknown	60% =420	30% =210	5% =35	5% =35			
33	yes	"40 or 50" =47	1	yes	0	no	5	15	30	2	0			
34	yes	"45" =46	1	yes	"2 or 3" =2	yes	"1 or 2" =1	36	5	3	2			
35	yes	"20" =40	3	yes	"10" date check=10	yes	5	30	10	0	0			
36	yes	20-30 unknown =21	1	yes	1	no	"unsure ?10" =10	"up to 1-5" =1	"20-30" =20	0	0			
37	yes	"not sure..>50" = 26	3	yes	2	no	5	"20 or 30" =20	"?5" =5	1	0		NEW	
38	yes	"> 150" =150	1	yes	"just me " =1	yes	">20" =20	40% =60	40% =60	18% =27	2% =3			
39	yes	286	1	yes	5	yes	no answer	187	62	10	no answer = 27			
40	yes	"250" =232	1	yes	1	yes	"not available"	110	67	50	5			
41	yes	"400" =410	2	yes	2	yes	"apx 10 a week"=10	180	200	20	"[?]10 on xolair"=10			
42	yes	"don't know"	1	no	1	yes	"don't know"	"don't know"	"don't know"	"don't know"	"don't know"			
43		5486/40												
44	patients at clinic on biologics	total pts on biologics	nurses working in biologic	respondents who work in biologics at their practice	nurses trained in biologics	respondents trained in biologics	patients undergoing biologic workup	psoriasis patients on biologics	eczema patients on biologics	Hidradenitis suppurativa patients on biologics	chronic spontaneous urticaria patients on biologics	one clinical trial lichen pilaris	active members	known no. total patients
45	37	est. 4431	80	36	65	29	234	2347	1406	307	156	15	235	4391
46	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	40/235 active members	
47	92.5% of respondent clinics use biologics	110.775 patients per clinic	2 nurses in each clinic	90%	average 1.65 trained nurses but nit all utilised	72.5% of respondents working / trained	average 5.85 patients working up	average 58.68 psoriasis Iper clinic	35.15 eczema average	7.68 HS average	3.9 CSU average	0.38 clinical trial participants	17.02% response rate	87.38% per clinic
48		discrepancy of 200 as no specific answer, though est.					averages rounded							

Discussion— The research highlight important data as some responses included transcription. Although no qualitative questions were asked, the natural response from many nurses was to be descriptive giving rich data. For example, "Unsure, consultant knows answer"; "Unsure as consultants treat patients", with six similar responses. This also shows some clinics and dermatologists do not utilise their nurse workforce for continuation reviews for patients on biologics. Other nurses guessed values, by placing a question mark (?) or greater than sign (>) next to their reported numbers, leading to averages being estimated and 200 unknown allocations to disease treatment. Others were confident in their responses; surprisingly these were not only from large clinics—some had smaller numbers but greater nurse input. Others used percentages "700" patients, 60%, 30%, 5%, 5%". These were translated into 420, 210, 35, 35 respectively for psoriasis, eczema, HS and CSU. Another stated 378 patients, distributed between 220, 101, 25 and 12 respectively. Many were unsure the number of patients 'working up' to biologics, however, this may have been mis-interpreted in the question, as many nurse significantly contribute to 'work-up' through phototherapy, severity assessments before and after treatments, safety monitoring and reporting toxicities during skin assessments and patient experience, and encouraging adherence to treatment towards biologic qualification (Services Australia, 2022), highlighting a gap in knowledge of what is involved in this continuum and the need for education. It seemed numbers of nurses involved in case-managing patient loads did not necessarily correspond with the larger number of biologics prescribed and clinic workflow, showing nurse education, clarity of scope and physician collaboration was key to this pattern.

Research shows nurses contributing to patient care add value, increase satisfaction and treatment adherence, enabling consumer self-management and improved health outcomes (Aldredge & Young, 2009; Beauvais, et al., 2022; Candelas, et al., 2021Palmer & Miedany, 2010). Australian nurses are highly trained to NMBA standards and are intuitive, adapting Australian nursing standards to patient care in different specialties. There are gaps in consistency of dermatology nurses' education as ADNA do not have set education modules for their members, highlighting a workforce gap that requires improvement. Currently each clinic educates without set criteria, creating role confusion between the teams, limiting nursing advancement, and this may contribute to the results of the survey. Nurses are willing to expand knowledge and develop skills. Through team collaboration opportunities for dermatologists, nurses and patients to partner in their care will present (ASQHC, 2023). Unequal responsibilities between clinic sites corresponded with unknown patient numbers "doctor knows"; "unsure"; patient numbers were shown to reach clinic limit "two doctors have stopped seeing [new] patients".

Limitations to this research include small sample size, ad hoc survey (unvalidated), no qualitative questions to add richness to opinion and experience and lacked physician and consumer input. Advantages include untapped Australian nurse knowledge collated into one survey. This means the results show nurse scope, nurse-led activities and patient benefits (not part of the research)

The quality of evidence of this research is a second level cohort study with reporting bias due to the small number of responses (Hoffmann, et al, 2017; NHMRC, 2009). Increasing the data collection period might decrease this bias; however, is dependent on nurse member response to emails interest in participating, access and personal interest (Hoffmann et al., 2017). It is not generalisable to other countries, or even dermatology nurses outside the ADNA membership as they could not be surveyed. The survey sent to nurse members allowed de-identified responses, but also meant more than on nurse from each clinic could respond—noting 2 on average per clinic. Once this was realised, an email was sent requesting one response per clinic. Data was screened for similarities. Two responses were similar, both stating 50 biologic patients, each with unknown disease allocation and were noted in overall number but not specific medicine categories as "unknown" status. It is believed the results are valid and represent many dermatology nurses within the Australian context. More nurses responding with "no" biologic patients, or even "yes" and accurate numbers, would result in 80% powered response enabling better generalisable data for the Australian context. This research was not intended to show patient benefit only nurse activity.

Conclusion—More research needed into patient outcomes within the Australian context between those with nurse involvement in their care and those with doctor only. More nurse training programs are needed to provide consistent nursing skills in this growing field of dermatology, leading to increased competencies and permissions for nurses to actively assist patients, thus relieving administration workload for doctors, increase patient benefits through complementary health practitioner holistic care.

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Survey of Australian Dermatology Nurses' Association (ADNA) members into biologic medicines for inflammatory diseases in dermatology practices: Highlighting increased nurse training and scope.

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appendix 1

Search number	Query	Sort By	Filters	Search Details	Results	Time
14	(#13) AND (#12)			("scope"[All Fields] OR "scopes"[All Fields] OR "scoping"[All Fields] OR ("role"[MeSH Terms] OR "role"[All Fields])) AND ("nurs*"[All Fields] AND (("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND ("biological therapy"[MeSH Terms] OR ("biological"[All Fields] AND "therapy"[All Fields]) OR "biological therapy"[All Fields] OR ("biologic"[All Fields] AND "therapy"[All Fields]) OR "biologic therapy"[All Fields]) AND ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields])	71	20:59:36

13	(scope) OR (role)	AND (("patient*"[All Fields] AND "inflammat*"[All Fields]) OR ("psoriasis"[MeSH Terms] OR "psoriasis"[All Fields] OR "psoriases"[All Fields] OR "psoriasi"[All Fields]) OR ("eczema"[MeSH Terms] OR "eczema"[All Fields] OR "eczemas"[All Fields]) OR ("dermatiti"[All Fields] OR "dermatitis"[MeSH Terms] OR "dermatitis"[All Fields] OR "dermatitides"[All Fields]) OR ("hidradenitis suppurativa"[MeSH Terms] OR ("hidradenitis"[All Fields] AND "suppurativa"[All Fields]) OR "hidradenitis suppurativa"[All Fields]) OR ("hisp sacra"[Journal] OR "hs"[All Fields]) OR ("urticaria"[MeSH Terms] OR "urticaria"[All Fields] OR "urticarias"[All Fields])))) "scope"[All Fields] OR "scopes"[All Fields] OR "scoping"[All Fields] OR "role"[MeSH Terms] OR "role"[All Fields]	3,424,758	20:59:06
12	(nurs*) AND (#11)	"nurs*"[All Fields] AND (("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND ("biological therapy"[MeSH Terms] OR ("biological"[All Fields] AND "therapy"[All	461	20:58:17

11	(#6) AND (#8)	Fields]) OR "biological therapy"[All Fields] OR ("biologic"[All Fields] AND "therapy"[All Fields]) OR "biologic therapy"[All Fields]) AND ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND (("patient*"[All Fields] AND "inflammat*"[All Fields]) OR ("psoriasis"[MeSH Terms] OR "psoriasis"[All Fields] OR "psoriases"[All Fields] OR "psoriasi"[All Fields]) OR ("eczema"[MeSH Terms] OR "eczema"[All Fields] OR "eczemas"[All Fields]) OR ("dermatiti"[All Fields] OR "dermatitis"[MeSH Terms] OR "dermatitis"[All Fields] OR "dermatitides"[All Fields]) OR ("hidradenitis suppurativa"[MeSH Terms] OR ("hidradenitis"[All Fields] AND "suppurativa"[All Fields]) OR "hidradenitis suppurativa"[All Fields]) OR ("hisp sacra"[Journal] OR "hs"[All Fields]) OR ("urticaria"[MeSH Terms] OR "urticaria"[All Fields] OR "urticarias"[All Fields]))) ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR	35,602	20:57:31

"biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND ("biological therapy"[MeSH Terms] OR ("biological"[All Fields] AND "therapy"[All Fields]) OR "biological therapy"[All Fields] OR ("biologic"[All Fields] AND "therapy"[All Fields]) OR "biologic therapy"[All Fields]) AND ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND (("patient*"[All Fields] AND "inflammat*"[All Fields]) OR ("psoriasis"[MeSH Terms] OR "psoriasis"[All Fields] OR "psoriases"[All Fields] OR "psoriasi"[All Fields]) OR ("eczema"[MeSH Terms] OR "eczema"[All Fields] OR "eczemas"[All Fields]) OR ("dermatiti"[All Fields] OR "dermatitis"[MeSH Terms] OR "dermatitis"[All Fields] OR "dermatitides"[All Fields]) OR ("hidradenitis suppurativa"[MeSH Terms] OR

		("hidradenitis"[All Fields] AND "suppurativa"[All Fields]) OR "hidradenitis suppurativa"[All Fields]) OR ("hisp sacra"[Journal] OR "hs"[All Fields]) OR ("urticaria"[MeSH Terms] OR "urticaria"[All Fields] OR "urticarias"[All Fields])) ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND ("biological therapy"[MeSH Terms] OR ("biological"[All Fields] AND "therapy"[All Fields]) OR "biological therapy"[All Fields] OR ("biologic"[All Fields] AND "therapy"[All Fields]) OR "biologic therapy"[All Fields]) AND ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields])		
10	(#6) AND (#7)	AND (("nurse s"[All Fields] OR "nurses"[MeSH	3	20:56:38

		Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) AND ("nurse s"[All Fields] OR "nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) AND ("nurse practitioners"[MeSH Terms] OR ("nurse"[All Fields] AND "practitioners"[All Fields]) OR "nurse practitioners"[All Fields] OR ("nurse"[All Fields] AND "practitioner"[All Fields]) OR "nurse practitioner"[All Fields]) AND (("advance"[All Fields] OR "advanced"[All Fields] OR "advancement"[All Fields] OR "advancements"[All Fields] OR "advances"[All Fields] OR "advancing"[All Fields]) AND "nurs*"[All Fields]) AND ("physician assistants"[MeSH Terms] OR ("physician"[All Fields] AND "assistants"[All Fields]) OR "physician assistants"[All Fields] OR ("physician"[All Fields] AND "assistant"[All Fields]) OR "physician assistant"[All Fields])) ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND ("biological therapy"[MeSH Terms] OR		
9	(((#6)) AND (#7)) AND (#8)	("biological"[All Fields] AND "therapy"[All	1	20:36:00

Fields]) OR "biological therapy"[All Fields] OR ("biologic"[All Fields] AND "therapy"[All Fields]) OR "biologic therapy"[All Fields]) AND ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields]) AND (("nurse s"[All Fields] OR "nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) AND ("nurse s"[All Fields] OR "nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) AND ("nurse practitioners"[MeSH Terms] OR ("nurse"[All Fields] AND "practitioners"[All Fields]) OR "nurse practitioners"[All Fields] OR ("nurse"[All Fields] AND "practitioner"[All Fields]) OR "nurse practitioner"[All Fields]) AND (("advance"[All Fields] OR "advanced"[All Fields] OR "advancement"[All Fields] OR "advancements"[All Fields] OR "advances"[All Fields] OR "advancing"[All Fields]) AND "nurs*"[All Fields]) AND ("physician assistants"[MeSH Terms] OR ("physician"[All Fields] AND "assistants"[All Fields]) OR "physician assistants"[All Fields] OR

8	(((((((patient*) AND (inflammat*)) OR (psoriasis)) OR (eczema)) OR (dermatitis)) OR (hidradenitis suppurativa)) OR (HS)) OR (urticaria)	("physician"[All Fields] AND "assistant"[All Fields]) OR "physician assistant"[All Fields])) AND (("patient*"[All Fields] AND "inflammat*"[All Fields]) OR ("psoriasis"[MeSH Terms] OR "psoriasis"[All Fields] OR "psoriases"[All Fields] OR "psoriasi"[All Fields]) OR ("eczema"[MeSH Terms] OR "eczema"[All Fields] OR "eczemas"[All Fields]) OR ("dermatiti"[All Fields] OR "dermatitis"[MeSH Terms] OR "dermatitis"[All Fields] OR "dermatitides"[All Fields]) OR ("hidradenitis suppurativa"[MeSH Terms] OR ("hidradenitis"[All Fields] AND "suppurativa"[All Fields]) OR "hidradenitis suppurativa"[All Fields]) OR ("hisp sacra"[Journal] OR "hs"[All Fields]) OR ("urticaria"[MeSH Terms] OR "urticaria"[All Fields] OR "urticarias"[All Fields])) ("patient*"[All Fields] AND "inflammat*"[All Fields]) OR ("psoriasis"[MeSH Terms] OR "psoriasis"[All Fields] OR "psoriases"[All Fields] OR "psoriasi"[All Fields]) OR ("eczema"[MeSH Terms] OR "eczema"[All Fields] OR "eczemas"[All Fields]) OR ("dermatiti"[All Fields] OR "dermatitis"[MeSH Terms] OR "dermatitis"[All Fields] OR "dermatitides"[All Fields]) OR ("hidradenitis suppurativa"[MeSH Terms] OR ("hidradenitis"[All Fields] AND "suppurativa"[All Fields]) OR "hidradenitis suppurativa"[All Fields]) OR ("hisp sacra"[Journal] OR "hs"[All Fields]) OR	824,610	20:33:23

		("urticaria"[MeSH Terms] OR "urticaria"[All Fields] OR "urticarias"[All Fields]) ("nurse s"[All Fields] OR "nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) AND ("nurse s"[All Fields] OR "nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) AND ("nurse practitioners"[MeSH Terms] OR ("nurse"[All Fields] AND "practitioners"[All Fields]) OR "nurse practitioners"[All Fields] OR ("nurse"[All Fields] AND "practitioner"[All Fields]) OR "nurse practitioner"[All Fields]) AND (("advance"[All Fields] OR "advanced"[All Fields] OR "advancement"[All Fields] OR "advancements"[All Fields] OR "advances"[All Fields] OR "advancing"[All Fields]) AND "nurs*"[All Fields]) AND ("physician assistants"[MeSH Terms] OR ("physician"[All Fields] AND "assistants"[All Fields]) OR "physician assistants"[All Fields] OR ("physician"[All Fields] AND "assistant"[All Fields]) OR "physician assistant"[All Fields])		
7	((((nurse) AND (nurses)) AND (nurse practitioner)) AND (advanced nurs*)) AND (PHYSICIAN ASSISTANT)		540	20:31:39
6	((biologic) AND (biologic therapy)) AND (biological)	("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR	579,128	20:30:47

		"biology"[All Fields] OR "biological"[All Fields]) AND ("biological therapy"[MeSH Terms] OR ("biological"[All Fields] AND "therapy"[All Fields]) OR "biological therapy"[All Fields] OR ("biologic"[All Fields] AND "therapy"[All Fields]) OR "biologic therapy"[All Fields]) AND ("biological products"[MeSH Terms] OR ("biological"[All Fields] AND "products"[All Fields]) OR "biological products"[All Fields] OR "biologic"[All Fields] OR "biologicals"[All Fields] OR "biological factors"[MeSH Terms] OR ("biological"[All Fields] AND "factors"[All Fields]) OR "biological factors"[All Fields] OR "biologics"[All Fields] OR "biologically"[All Fields] OR "biology"[MeSH Terms] OR "biology"[All Fields] OR "biological"[All Fields])		
5	((((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*)))) AND ((scope))	((((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*)))) AND ((scope))	0	20:29:45
4	((((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*)))) AND ((scope)) - Schema: all	((((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*)))) AND ((scope))	0	20:29:45

2	(Biologic use in inflammatory diseases and nurse scope) AND (((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*))) - Schema: all	(Biologic use in inflammatory diseases and nurse scope) AND (((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*)))	0	20:28:16
3	(Biologic use in inflammatory diseases and nurse scope) AND (((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*)))	(Biologic use in inflammatory diseases and nurse scope) AND (((biologic OR biologics OR biological) AND (scope) AND (nurse OR nurses OR nursing OR advanced nursing OR advance nurse OR nurse practitioner OR nurse prescriber OR physician assistant OR biologic nurs*) And (psoriasis OR eczema OR dermatitis OR hidradenitis suppurativa OR urticaria OR inflammat*) AND (patient*)))	0	20:27:50
1	(biologic*) AND (nurs* OR nurses OR nurse practictioner OR Advanced nurs* OR physician assistant)	"biologic*"[All Fields] AND ("nurs*"[All Fields] OR ("nurse s"[All Fields] OR "nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) OR (("nurse s"[All Fields] OR "nurses"[MeSH Terms] OR "nurses"[All Fields] OR "nurse"[All Fields] OR "nurses s"[All Fields]) AND ("practictioner"[All Fields] OR "practictioners"[All Fields])) OR (("advance"[All Fields] OR "advanced"[All Fields] OR "advancement"[All Fields] OR "advancements"[All Fields] OR "advances"[All Fields] OR "advancing"[All Fields]) AND "nurs*"[All Fields]) OR ("physician assistants"[MeSH Terms] OR ("physician"[All	15,181	20:16:33

Fields] AND "assistants"[All Fields]) OR
"physician assistants"[All Fields] OR
("physician"[All Fields] AND "assistant"[All
Fields]) OR "physician assistant"[All Fields]))

Survey of Australian Dermatology Nurses' Association (ADNA) members into biologic medicines for inflammatory diseases in dermatology practices: Highlighting increased nurse training and scope.

Vivienne Speirs RN, BN (Hon) WSU, CertDerm ACN, MAdvN (Chronic and Complex) UTS

Appendix 2 August to September 2023

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	questions regarding biologic medicines													
2	Do you have patients prescribed biologic medicines?	How many patients are prescribed biologic medicines for their inflammatory diseases at your dermatology practice?	How many nurses work with these patients; either in their assessments or applications?	Do you work with these patients at your practice?	How many nurses at your practice have training in biologic medicines, personal research, Masterclasses, education days or sponsored evening events?	Did you partake in training to become proficient in these medicines?	How many patients are currently 'working up' to qualifying for biologics?	How many patients are there on Psoriasis biologics?	How many for eczema?	How many for hidradenitis Suppreliva?	How many chronic spontaneous urticaria?			
3	yes	"80" =82	3	yes	1	yes	2	36	44	0	2			
4	yes	"50-100" =59	3	yes	1	yes	"3?" =3	"50-100?" =50	"6?" =6	"3?" =3	0			
5	yes	3	3	yes	3	yes	3	1	2	0	0			
6	yes	"> 100" =122	2	yes	0	no	30	70	40	10	2			
7	yes	45	1	yes	"1 or 2" = 1	yes	"2 or 3" = 2	35	5	3	2			
8	yes	149	1	yes	1	yes	" possibly 12" =12	92	51	5	1			
9	yes	"> 100" =100	6	yes	5	yes	unsure	unsure	unsure	unsure	unsure			
10	yes	" over 50" = 73	5	yes	0 "on the job training"	no	10	30	30	3	10			
11	yes	">100" =160	1	yes	1	yes	accuracy diff.; ongoing	">100" = 100	">50" =50	">10" =10	nil			
12	yes	"175" =170	1	yes	1	yes	5	100	40	15	15			
13	yes	250	2	yes	2	yes	30	120	100	30	unanswered			
14	yes	50	0	yes	unsure	yes	unsure	unsure	Unsure, Consultan	unsure	unsure	35		
15	yes	20	3	yes	1	no	unsure	3	17	0	0			
16	yes	"hundreds" =198	4	yes	4	yes	6	">100" =100	80	10	8			
17	no	no	"i changed jobs"	yes		yes	0	0	0	0	0			
18	yes	"100" =110	2	yes	"yes drug rep..." =2	no	"2 or 3" = 2	45	55	6	4			
19	yes	31	1	no	1	no	20	15	15	1	0			
20	yes	150	1	yes	1	yes	5	80	30	20	5	15 clinical trial		
21	yes	"around 100" =106	3	yes	3	yes	2	"around 70" =70	30	3	3			
22	yes	"120" =102	1	yes	1	yes	10	60	"23 ? more" =23	12	7			
23	yes	"nurses inject 2"=3	dermatologists role	yes	none	no	dermatologists role	"not many"	"unsure"	none	3			
24	yes	20	2	yes	2	yes	10	10	10	nil	nil			
25	yes	"50'ish" =50	3	yes	no answer	yes	not sure	not sure	not sure	not sure	not sure			
26	no													
27	no													
28	yes	59	3	yes	1	yes	3	"50-100" =50	"67" =6	"3 that I know"=3	none			
29	yes	"not huge .." = 3	3	yes	3	yes	3	1	2	0	0			
30	yes	358	2	yes	2	yes	"20-30" =20	220	101	25	12			
31	yes	"Unsure exact...Dr knows.."	"1 main + 3" =4	yes	1	yes	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer	Unsure, Consultant knows the answer			
32	yes	"700 (7 Drs)" =700	"5 nurse r/v" =5	yes	2	" yes and helpful"	unknown	60% =420	30% =210	5% =35	5% =35			
33	yes	"40 or 50" =47	1	yes	0	no	5	15	30	2	0			
34	yes	"45" =46	1	yes	"2 or 3" =2	yes	"1 or 2" =1	36	5	3	2			
35	yes	"20" =40	3	yes	"10" date check=10	yes	5	30	10	0	0			
36	yes	20-30 unknown =21	1	yes	1	no	"unsure ?10" =10	"up to 1-5" =1	"20-30" =20	0	0			
37	yes	"not sure..>50" = 26	3	yes	2	no	5	"20 or 30" =20	"?5" =5	1	0		NEW	
38	yes	"> 150" =150	1	yes	"just me" =1	yes	">20" =20	40% =60	40% =60	18% =27	2% =3			
39	yes	286	1	yes	5	yes	no answer	187	62	10	no answer = 27			
40	yes	"250" =232	1	yes	1	yes	"not available"	110	67	50	5			
41	yes	"400" =410	2	yes	2	yes	"apx 10 a week"=10	180	200	20	"[?]10 on xolair"=10			
42	yes	"don't know"	1	no	1	yes	"don't know"	"don't know"	"don't know"	"don't know"	"don't know"			
43		5486/40												
44	patients at clinic on biologics	total pts on biologics	nurses working in biologic	respondents who work in biologics at their practice	nurses trained in biologics	respondents trained in biologics	patients undergoing biologic workup	psoriasis patients on biologics	eczema patients on biologics	Hidradenitis suppuritiva patients on biologics	chronic spontaneous urticaria patients on biologics	one clinical trial (often pfizer)	active members	known no. total patients
45	37	est. 4431	80	36	65	29	234	2347	1406	307	156	15	235	4931
46	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	n/40	40/235 active members	
47	92.5% of respondent clinics use biologics	110.775 patients per clinic	2 nurses in each clinic	90%	average 1.65 trained nurses but nit all utilised	72.5% of respondents working / trained	average 5.85 patients working up	average 58.68 psoriasis lper clinic	35.15 eczema average	7.68 HS sverage	3.9 CSU average	0.38 clinical trial participants	17.02% response rate	87.38% per clinic
48		discrepancy of 200 as no specific answer, though est.					averages rounded							

Survey of Australian Dermatology Nurses' Association (ADNA) members into biologic medicines for inflammatory diseases in dermatology practices: Highlighting increased nurse training and scope.
Vivienne Speirs RN, BN (Hon) WSU, CertDerm ACN, MAdvN (Chronic and Complex) UTS

Appendix 3 critical appraisal of included paper

date/ publisher	title	summarised evidence	quality/evidence

16 J Dermatol Nures Assoc.2016 Jan;8(1):14-26. doi: 10.1097/JDN.0000000000000185. Epub 2016 Feb 12.	Providing Guidance for Patients With Moderate-to-Severe Psoriasis Who Are Candidates for Biologic Therapy: Role of the Nurse Practitioner and Physician Assistant	Advanced nurses conversations with pts regarding psoriasis and managing disease, expectations, treatment options as assessing efficacy--need to change, discussing options, initiating tratement therapies, optimizing adherence, pstient self-management, barriers to health literacy, lifestyle choices, needle phobia and possible side effects, treatmnts costs and --USA relevance--insurance. Nurse Practitioners can optimize results, adherences, and co=morbidities during the life contiuum. Includes symptoms of stress, itch, emabarassment, depression, inflammation, chronic diseases, metabolic syndrome. Patients/careres treatments goals collaboratively planned, ihncluding all aspects of care--treatment, costs, duration, consistency, schedule for patient 'buy-in', adherence and satisfaction. NP and PA assets due to high demands on physicians--time savers, reducing wait itmes, increasing patient access, while advocating and listening to provide holistic care. 1. relationship building, increse pt knowledge, ability to cope, improved quality of care, well-being, wellness habits, hibnest discussions and 'buy-in' to disease process, partnership with long-term treatment plans and goals. NP examins skin, ask S&S, overall health r/v, explain tests, probe to obtain management habits, foster trust. Education, provide information, guide, reamin current in EBP, f/u periodically and open daoor policy, communicate. 2.Patient management: **Set reasonable expectation**. Enquire **prior knowledge** (health literacy) and work from there. Some use Google, blogs. Some are fearful. **Some lack insight into treatments** and rely on health team. **Guidance and realistic expectations** can help the journey. ALL understand they have a disease that affects them personally. **Emphasise long-term followup and treatment plans, with realistic immediate expectations and convenience** of treatment options. With non-adherence there may be **barriers: cost, routine, busyness, forgetfulness. Flve factors: Socioeconomic, HCP relational breakdown, disease complications, treatment barriers, person-centred barriers.** ASk how they are, how we can help, maintain contact. **Proactive discussion** about pregnancy and other life events helps plan strategies for consitent disease maintanence. Being fully informed of	Literature search, summary with good evidence. Level three expert opinion (NHMRC, 2009; NSW Government, 2020).

		biologic mode of actions, risks ad benefits is important in the **nurse role. Tests: baseline and annual blood tests and TB, hep B (TNFa), LFTS (also observed S&S nausea, loss of apetite, pruritus).** Notes three monthly f/u and NP prescribing. Insurance and costs irre;levant to AUSTRALIA. Photgraphs to monitor improvement. Visit adherence: reminders, smart phones, telehealth--AUD use visual, transport issues, timing, workplace, flexible vistis helps, pre-testing bloods savestimer..	

Young, M. S. (2003). Preparing dermatology nurses: biologic therapy for psoriasis. *Dermatology Nursing*, *15*(5), 413.	Preparing dermatology nurses: biologic therapy for psoriasis.	**speaks of toxicities, time consuming therapies including topical applications that create mess, time, discomfort,** and also phototherapy which means time lost from work or school and cost. Discusses immune system basics precluding development of psoriasis, and molecular immunetargeting medicines through research to treat chronic immun-modulated inflammatory diseases. **It finally refers the role of the nurs. paper stops there.**	very old and not accessible

Palmer, D., & Miedany, Y. E. (2010). Biological nurse specialist: goodwill to good practice. *British Journal of Nursing*, *19*(8), 477-48.	Biological nurse specialist: goodwill to good practice.	Speaks of nurse specialist back (2010) for rheumatology, including psoriatic arthritis. Requires good infrastructure and specialist nursing personnel, responsible for screeningpathway, home drug delivery (pharmacist in Australia) and self-management, monitoring, patient support, scheduled prescription, enabled by specialist nurses providing holistic care, stating rheumatology has long prescribed biologics, outnumbered other diseases, and utilised nurse infusion skills, ability to assess patient safety and disease modification; questions with other specialties combining rheumatology, dermatology and others to reduce severl separate departments and funsing. It quotes governmental planning to use specialised nurses in **integrated care of complex patients with combined generalist / specilist care continuity of care**. Expectations: **holistic approach**, moved from administration and monitoring for side effects to **in-depth knowledge of medicine, disease** process, foundational to biologic therapy must be aetiology, disease activity, experience and training, cannulation skills; commencing from **time of referral**, **screening tests** (TB infection and possible reactivation) and **physiological assessments, checklist for side effects and questions to ask**, **manage patient flow** and bookings decided by nurses , **monitor for symptoms**, **train patients self-injection**, **enhance patient experience and enable their learning** of their disease and personal needs. **Provide assistance** when they ar e away from the clinic through **phone and email**. **Healthy lifestyle advice, continuous education of staff**, **self auditing and professionalism and documentation**. See need for self-education and pursue. Develop protcols,pre-biologic nurse assessment, protcols fro administration, hotline for patients assess disease progression and changes. **Listen to patients, liaise with medical team as advanced practice nurses.**	Expert opinion, changed practice and guideline based on exerpt experience and evidence. Level three.

Beauvais, C., Fayet, F., Rousseau, A., Sordet, C., Pouplin, S., Maugars, Y., Poilverd, R. M., Savel, C., Ségard, V., Godon, B., L'amour, C., Perdriger, A., Brin, F., Peyrard, P., Chalier, F., Pallot-Prades, B., Tuffet, S., Griffoul, I., & Gossec, L. (**2022**). Efficacy of a nurse-led patient education intervention in promoting safety skills of patients with inflammatory arthritis treated with biologics: a multicentre randomised clinical trial. *RMD open*, *8*(1), e001828. https://doi.org/10.1136/rmdopen-2021-001828	Efficacy of a nurse-led patient education intervention in promoting safety skills of patients with inflammatory arthritis treated with biologics: a multicentre randomised clinical trial.	notes:previously nurse-led education was not common in all settings so research into **Nurse-led, patient education at commencement of medicine prescription** in inflammatory diseases to prevent complications with medicine **safety and adherence**. **Teaching about safe vaccinations and avoidance of live vaccines, infections** along with correct doses and monitoring for symptoms of reduced effect and toxicities, patients are empowered in self-management of their disease. **Using a RCT assessing at baseline, three months and kmeasured at six months, compared with usual care.** It used **validated tools Bioscore questionnaire**, (0-100scale) assessing patient competencies coping with vaccination, psychological well-being beliefs, disease activity, fever and infections, including rate of severe infections. 129 patients RA and spondylosingarthritis in 9 sites. !22 completed, 127 analysed--intention to treat. 64 received intervention by nurses (45-60 min) at baseline and 3 months. Has broad 95% confidence intervals in higher skills within educated group. Higher infection risks in comedicated RA and glucocorticoids with pheumonia, bronchitis, pyelnephritis, soft tissue and skin infections--bacterial and often stphylococcus. Severe infection include pneomococcal and influenza. With safety training risks reduce. Training for all patients and problem-solving assessments essential for those prescribed high risk medicines and also biologics medicines.	Level one evidence. Strength of design--mutli centred. RCT, validated tools, reached 80% power. Not necessarily tranlated to dermatology and Australia, but as it assessed nurse-led intervention of education, copying the education tools could well prove effective in increasing patient safety.
Trettin, B., Feldman, S., Andersen, F., Danbjørg, D. B., & Agerskov, H. (2021). Improving management of psoriasis patients receiving biological treatment: A qualitative approach. *Nursing open*, *8*(3), 1283–1291. https://doi.org/10.1002/nop2.745	Improving management of psoriasis patients receiving biological treatment: A qualitative approach.	Three phases to improve patient experiences when receiving biologics using explorative hermeneutic theory with three phases: one identify needs, two telehealth to find solution to needs noted in phase one. Three t to implement on face to face visit. Despite health professionals feelingt they lacked motivational interviewing skills to support patients in lifestyle behaviour changes and strategies, which challenged them as professionals, the results were improved patient biomedical and lifestyle routines; however they found the frequent 'visits' were inconvenient. Quarterly reviews.	*qualitative: 40 observed, 18 recoruited and signed onfomred consent and 15 participants completed in one Danish hospital*

	removed Cazaniga et al, 2019; Deleuran,et al, 2020; Headon, 2016; Larsson et al, 2009; Sbidian et al, 2020; Young, 2003		
Candelas, G., Villaverde, V., García, S., Guerra, M., León, M. J., & Cañete, J. D. (2016). Benefit of health education by a training nurse in patients with axial and/or peripheral psoriatic arthritis: a systematic literature review. *Rheumatology international*, *36*, 1493-1506.	Benefit of health education by a training nurse in patients with axial and/or peripheral psoriatic arthritis: a systematic literature review	**Nurses can contribute to the role of patients with psoriatic arthritis when prescribed biologics to increase adherence, self-management, increasing patients satisfaction. No control groups in each of the five papaers found, leading to anectotal evidence but patient satisfaction and improved positive results cannot be entirely dismissed, leading to the need for more evidence. ABSTRACT only**	Level 1 systematic review
Aldredge, L. (2016). Chapter 5 'Biologic therapies for dermatology conditions', in N Nicol, *Dermatologic Nursing Essentials: A Core Curriculum*. Wolters Kluwer Health. Kindle Edition.	Biological nurse specialist: goodwill to good practice.	The aim of the chapter is to prmote knowledge of biologic options--continually being updated and relevance is dependent on country--along with clinical criteria, monitroing and side effects, with councelling to ensure patients to understand, promoting medicine safety. Teaching how to identify candidates, riska and benfits, and necessary ifestyle modifications, including weight loss, smoking cessation and immunisations. Its context is American but is valuable and can be adapted to fit with AUstralian Standards for Medicare applications.	Level 1 textbook though outdated

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