

Reduced excision of benign skin lesions through tiered practitioner, general practitioner with a special interest in skin cancer and dermatologist clinical review within New Zealand integrated family healthcare

Louise Reiche, Adrian Macquet, Anna Skinner, Sarah Fursdon

International best evidence study data state that accuracy in diagnosing skin cancers, invasive melanoma and atypical intra-epidermal melanocytic variants is higher for in-person dermatologist diagnosis compared to image-based evaluations and compared to other trained professionals.¹⁻⁵

Because of the lag phase between sun exposure and skin cancer development, and despite SunSmart interventions, New Zealand skin cancer rates are predicted to continue to increase over the next decade or so.⁶ Non-melanoma skin cancers have not been adequately recorded, masking problem severity.⁷ New Zealand has both an ageing and workforce medical shortage issue, including dermatologists and general practitioners.⁸ Medical workforce deficiencies and a growing New Zealand population compound pressures on future health services, which inspires innovative approaches to optimise early skin cancer detection and efficient management practices.⁹ Reducing unnecessary surgical excision of benign lesions and reducing missed cancers is desired. Both are achievable with appropriate training.^{10,11}

MidCentral District Health Board (DHB) public hospital skin lesion referrals are rejected without an accompanying clinical

image and may take four to six months to be seen, which can be shortened by the inclusion of melanoma biopsy histology.

We propose a pragmatic efficient clinical triage approach to straddle need and service mismatch.

Kauri HealthCare, New Zealand's largest MidCentral DHB public health organisation and an integrated family healthcare practice of over 20,000, (21,193), features both a general practitioner with a special interest in skin cancer (GPwSISC) clinic and a dermatologist. The GPwSISC has completed two six-month Skin Cancer College Australasia courses: (1) Dermoscopy and (2) Advanced Skin Cancer Surgery and Medicine. The practice provides rotations for both nursing and medical students and early graduates.

Referrals to the GPwSISC come from other practitioners within the practice and directly from the practice patient population.

Twice-weekly sessions of three 5–10-minute appointments were provided for patients who referrers believed were unable to afford private dermatology care, during the study period. Appointments were booked directly by general practitioners, nurse practitioners or junior medical staff (collectively, "other practitioner"). Practitioners attended with the patient,

presented the history, sought clarification of uncertainties, recorded information and facilitated recommended investigations or therapies, and simultaneously received both a specialist dermatology opinion and practical and academic teaching. Additional ad lib mini electronic referrals were made via the practice confidential intranet but not included.

MidCentral DHB Ethics and Research Office granted approval for this study. Over 30 months (April 2017–September 2019), 701 dermatology opinions were sought. Of these, 121 face-to-face consultations were for skin lesions (as opposed to rashes or other dermatological issues) that practitioners were uncertain about. Eighty-three were from GPwSISC and 38 from other practitioners. More than one lesion was assessed in many of these consultations, so the total lesions clinically reviewed face to face was 141 (GPwSISC) and 92 (other practitioner), providing a collective total of 233. The average patient age was 57 years with a standard deviation of 19 years. Fifty-eight percent were female (and 42% male).

Socioeconomic deprivation, as measured by area-based composite indices, inversely correlates with measures of health status.¹² Amalgamating each two of the original decile scoring provides a quintile score, whereby quintile 1 represents the least and quintile 5 the highest group of socioeconomic deprivation and thus likelihood of health needs. In this review, analysis for dermatology referrals matched the quintile breakdown for the practice population served. But referrals for opinions regarding skin lesions showed an inverse deprivation trend (Table 1).

Ethnicity analysis of Kauri HealthCare's population compared to those referred for lesion review shows a disproportional referral bias towards New Zealand European and Asian ethnicities and under-representation of Māori, Pacific and Middle Eastern peoples (Table 2). NZ European typically have fairer skin colour and are over-represented in the New Zealand skin cancer prevalence data.⁹ Quintile analysis (not shown) of our population has revealed that 52% of our Māori, and 58% of our Pasifika, are in quintile 4 and 5. Among other features associated with deprivation quintile assignment is inverse health literacy, communication means (telephone access) and transport, which all inhibit access to early (preventative) healthcare.¹²

Referred lesions subsequently clinically diagnosed as benign (ie, non-malignant) (eg, seborrheic keratosis, benign naevi, wart) or inflammatory (eg, prurigo, acne, eczema, tinea, granuloma annulare) exceeded clinically diagnosed malignant or precursor lesions, as shown in Table 3. Clinically diagnosed squamous cell carcinoma or melanoma were confirmed histologically but not lesions that were clinically benign or that could be managed readily by topical therapy (ie, biopsy/surgery was not otherwise indicated). Patients were encouraged to return should “benign” lesions progress after review, but none did so during this study period. Two lesions in Māori patients were clinically diagnosed as basal cell carcinoma (BCC), and one atypical, pigmented lesion suspicious of melanoma in a Chinese woman was histologically a compound naevus. All other cutaneous

Table 1: Quintile analysis of Kauri HealthCare population compared to those from that population referred for skin lesion dermatology review.

Quintile number	Quintile % for Kauri HealthCare	Quintile % for lesion referrals
quintile 1	23%	26%
quintile 2	18%	19%
quintile 3	23%	24%
quintile 4	21%	17%
quintile 5	15%	14%

malignancies were seen in those who classified themselves as European ethnicity.

Because all clinically confirmed or suspicious melanomas and squamous cell carcinomas required surgical excision, these were all histologically confirmed. Higher numbers of actinic keratoses were seen, and fewer squamous cell carcinoma in situ.

The ratio of lesions reviewed that no longer required a biopsy after dermatology review versus those that needed a biopsy (either for diagnostic exclusion or to remove a malignancy) (ie, benign to malignant) ratios were 2:1 for GPwSISC compared to 5:1 for other practitioners (Table 5).

“Biopsy justified / required to clarify possible malignancy” was seen in a higher percentage of referrals from GPwSISC (33%) compared to other practitioners (16%) to eliminate secondary dermatologist clinical diagnosis doubt and represents a greater proportion of “grey/ uncertain diagnoses.” There was a markedly better seborrheic keratosis diagnosis rate for GPwSISC: 2.1% versus 19.6%. Seborrheic keratoses are common changing, frequently pigmented, benign lesions, concerning patients and doctors. Extra dermatoscopic experience and training that GPwSISC and dermatologists have compared to other practitioners improves their accurate clinical diagnosis. However, over time the greater proportion of seborrheic keratoses were referred by incoming junior medical staff and more newly qualified practitioners compared to those who had used the service previously (data not shown).

The numbers of squamous cell carcinoma were close to those for melanoma in this review, and the GPwSISC brought more cases of melanoma compared to squamous cell carcinoma for clinical review. This may reflect a greater concern by patients and practitioners to miss an early diagnosis of melanoma than squamous cell carcinoma or this relatively young population (average age 57 years), as squamous cell carcinomas are seen more frequently in older and immunosuppressed populations.⁹

Confident diagnoses of benign and malignant lesions did not require dermatology review referral. Although many patients are referred by other practitioners to the GPwSISC, the figures discussed in this review pertain to lesions all practitioners were uncertain about. The populations between the comparative groups may therefore differ, and it is possible that lesions more suspicious of skin malignancy had been selectively referred (by other practitioners) to the GPwSISC, but there is no data to refute or confirm this. Following extended professional interactions among these practitioner groups, the dermatologist observed a superior skin lesion clinical and dermatoscopic knowledge and skill and interpretation by the GPwSISC (figures not shown in this review).

McGeoch et al eloquently demonstrated apprentice style surgical skill education provided by secondary care to primary care resulted in increased access to care, reduced waiting times and reduced the number of visits to hospital for skin cancer

Table 2: Kauri HealthCare background ethnicity percentage compared to those referred for skin lesion review.

Ethnicity	Percentage Kauri HealthCare population	Percentage Skin lesion referral
European	73%	86%
Māori	12%	5%
Pacific Peoples	3%	1%
Asian	3%	5%
Middle Eastern	1%	0%
Other	8%	3%

Table 3: Table showing total skin lesion referrals grouped into malignant, non-malignant or inflammatory categories and their respective commonest (greater than 1%) dermatologist clinical diagnosis.

	Dermatologist clinical diagnosis	Percentage (total 233)
Malignant skin lesions 30%	Basal cell carcinoma (BCC)	12%
	Melanoma	9%
	Squamous cell carcinoma (SCC)	9%
Malignant precursor 14%	Actinic keratosis	14%
Benign lesions 23%	Seborrheic keratosis	9%
	Naevi	9%
	Wart	4%
	Molluscum contagiosum	1%
Inflammatory lesions 33%	Eczema	1%
	Acne	1%
	Granuloma annulare	1%
	Prurigo	1%
	Tinea	1%
	Other (each <1%)	28%

Table 4: Comparison of commonest benign, premalignant and malignant keratinocyte and pigmented lesion diagnoses between a general practitioner with a special interest in skin cancer (GPwSISC) and other practitioners.

Clinical diagnosis	General practitioner with a special interest in skin cancer (GPwSISC)	Percentage	Other practitioner	Percentage
Superficial basal cell carcinoma (BCC)	2	1%	2	2%
Basal cell carcinoma (BCC)	19	14%	8	9%
Squamous cell carcinoma in situ	0	0%	4	4%
Squamous cell carcinoma (SCC)	8	6%	3	3%
Melanoma	13	9%	2	2%
Actinic keratosis	18	13%	21	23%
Other suspicious malignancy (eg, Merkel's, lymphoma, amelanotic melanoma)	6	4%	2	2%
Naevi	12	9%	6	7%
Lentigo	7	5%	1	1%
Seborrheic keratosis	3	2%	18	20%
Other benign lesions	53	37%	25	27%
Total lesions	141	100%	92	100%

management.¹³ That programme was supported by hospital management and funders, but in common with this review, it was also patient focused and resulted from initiation and cooperation by primary and secondary care clinicians. Both showed that training is time consuming for the vocational specialists concerned, but because more primary care practitioners were upskilled, reduced and more appropriate referrals to public secondary care services resulted.

McGeoch et al's study relied on electronic referral and clinical photograph triage and showed an increased number of total excised lesions (benign and malignant). This review differs by improving skin lesion clinical diagnosis, thus reducing the need to biopsy many benign lesions, which is an additional important step towards improved regional skin cancer management improvement and health resource use. Face-to-face joint consultations provide more opportunity for interactive learning, reinforcing strengths and addressing clinical uncertainties. In the short term, this is more time consuming for specialists, but longer term it increases overall health system efficiency compared to electronic and clinical

photograph triage referral (as shown by changing referral trends by increasingly trained practitioners).

In summary, the figures shown in this review showed more skin cancers in patients typically having fairer skin colour (European), a trend showing enhanced diagnostic accuracy having a GPwSISC within integrated family healthcare, and further considerable clinical diagnostic improvements from dermatologist expertise.^{10,11} Access to prompt expert diagnostic opinion avoided the need for secondary public hospital specialist referral and considerably reduced unnecessary biopsies, sparing patient morbidity, and it provided significantly earlier patient reassurance or treatments. Furthermore, face-to-face consultations with the attendant practitioner present facilitated active learning and may reduce future consultations. We recommend the presented model as a way that optimises general practitioner with a special interest in skin cancer (GPwSISC) and dermatologist expertise, and which could provide considerable assistance bridging the workforce shortage and pending incremental skin cancer service need.

Table 5: Comparison of a general practitioner with a special interest in skin cancer (GPwSISC) and other practitioners benign to (possible) malignant lesions requiring surgery.

	General practitioner with a special interest in skin cancer (GPwSISC)	Other practitioner
Biopsy justified / required for possible or confirmed basal cell carcinoma (BCC), squamous cell carcinoma (SCC), melanoma or other malignancy	46 (33%)	15 (16%)
Biopsy not required	95 (67%)	77 (84%)
Ratio of lesions not requiring biopsy / lesions requiring surgery	2:1	5:1

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Nil.

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Author information:

Louise Reiche: Dermatologist, LR Dermatology Ltd., Kauri HealthCare, Palmerston North.

Adrian Macquet: General Practitioner with Special Interest Skin Cancer, Kauri HealthCare, Palmerston North until December 2019.

Anna Skinner: Clinical Director and General Practitioner, Kauri HealthCare, Palmerston North.

Sarah Fursdon: Executive Assistant, Kauri HealthCare, Palmerston North.

Corresponding author:

Louise Reiche, Dermatologist, LR Dermatology Ltd., Kauri HealthCare, PO Box 545, Palmerston North 4410, 06 357 4424
admin@kaurihealthcare.nz

URL:

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