

Application for changes to the **Pharmaceutical Schedule**

A guide to help people, clinicians, clinical groups and consumer groups prepare funding applications to PHARMAC

Foreword

PHARMAC is the government agency that decides, on the behalf of District Health Boards, which pharmaceuticals should be publicly fund in New Zealand. For more information on the process PHARMAC uses to [make its funding decisions](#) and [how we determine if a proposal to fund a treatment would help us achieve our Statutory Objective](#), please visit the PHARMAC website.

PHARMAC's objective is "to secure, for eligible people in need of pharmaceuticals, the best health outcomes that are reasonably achievable from pharmaceutical treatment and from within the amount of funding provided".

Each year, PHARMAC receives a large number of applications that contain proposals either to fund new pharmaceuticals or to widen access to pharmaceuticals that we already fund. As PHARMAC must work within a fixed budget, we need to make difficult choices about which applications we should progress to a funding decision at any given time. This involves assessing large amounts of often complex information, to identify those proposals that would provide the best health outcomes.

We have written this funding application form for people, clinicians, clinical groups and consumer groups to use. We recognise that some individuals and groups won't have the same resource as pharmaceutical suppliers to prepare applications. This form is to help you provide the right information in order to progress the application.

This form is a guide – you don't have to follow it in detail, or at all, but it will make processing your application much easier and may reduce the time involved. If you don't know some information, please feel free to leave those sections blank; however the form does outline the general information that we need to assess a funding application. Having your application address these points may reduce follow-up questions to you, and could speed up how quickly we consider it.

The [Guidelines for Funding Applications to PHARMAC](#), updated in 2015, set out the full information that we need to progress any funding application. We expect pharmaceutical suppliers to follow the full *Guidelines for Funding Applications to PHARMAC* when submitting a funding application. However, as an applicant, please feel free to view them should you wish to have more detailed information on submitting an application.

Send your applications to us at:

Email: applications@pharmac.govt.nz

Post: PO Box 10254
The Terrace
Wellington 6143

You may also find it beneficial to talk to the relevant Therapeutic Group Manager at PHARMAC before you make a formal funding application. Please email us as above, and we will contact you.

We will keep you informed of progress. We publish and regularly update a record of all current funding applications via the Application Tracker on our website (www.pharmac.govt.nz), which details the current status of applications and relevant PTAC and subcommittee minutes.

Please note:

- We need you to supply copies of referenced articles that support the application, wherever possible. Have them referenced in the relevant section of the application form, and clearly say which (if any) cited publications you cannot provide.
- We prefer funding applications related to medicines that have been registered by Medsafe. While we can consider funding applications for unregistered medicines or unregistered indications, this is determined on a case-by-case basis.
- We may decide to defer our assessment of your application until we receive a full funding application from the supplier, which they would need to prepare in accordance with the full *Guidelines*.



PHARMAC
Pharmaceutical Management Agency

[New Zealand Government](#)

Changes to the Pharmaceutical Schedule Application

Applicant

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Are you making this application on behalf of a wider group (department, society, special interest group)? If so, who?

Breast Cancer Aotearoa Coalition

Is there anyone else that we should contact if we have questions about specific parts of this application?

No

Proposed pharmaceutical

Chemical

nanoparticle albumin-bound paclitaxel

Presentations and strengths

100mg powder for injection

Brand name(s)

ABRAXANE®

Suppliers (eg pharmaceutical companies, wholesalers)

Specialised Therapeutics Limited

Price

The current price is \$495 per vial including GST with a limit of \$9,000 (GST incl.) per patient for total treatment cost. Therefore, the list price would be \$430.43 per vial (excluding GST) with a limit of \$7826.09 (excluding GST) per patient.

Is it registered by Medsafe?

Yes – currently registered for three indications (1)

ABRAXANE is indicated for the treatment of metastatic carcinoma of the breast after failure of anthracycline therapy.

ABRAXANE, in combination with carboplatin, is indicated for the first-line treatment of non-small cell lung cancer in patients who are not candidates for potentially curative surgery and/or radiation.

ABRAXANE, in combination with gemcitabine, is indicated for the first-line treatment of patients with metastatic adenocarcinoma of the pancreas.

Describe the indication(s) that funding is being sought for.

Treatment of people with metastatic breast cancer

If this pharmaceutical has been registered by Medsafe, is it licenced for these indications? If not, is it licenced for these indications overseas? Please provide details.

Registered by Medsafe for treatment of metastatic breast cancer after failure of anthracycline therapy. However, consideration should be given to its use first line in metastatic breast cancer.

How many people in New Zealand do you expect would receive the pharmaceutical?

We estimate that between 50 and 200 people would receive the pharmaceutical annually – however this is dependent on any restrictions (if any) that might be recommended for access to treatment. In addition, there might be more patients in the first year of listing, reflecting prevalence of patients with metastatic breast cancer who cannot be treated with currently available treatments.

What is the expected dosing?

The recommended dose in the approved datasheet for ABRAXANE is 260 mg/m² administered intravenously over 30 minutes every 3 weeks. Based on results from clinical trials ABRAXANE can also be administered on a weekly basis. A summary of trials that included once weekly administration is attached (2).

Dose Adjustments During Treatment for Metastatic Breast Cancer Patients who experience severe neutropenia (neutrophil <0.5 x 10⁹/L for a week or longer) or severe peripheral neuropathy during ABRAXANE therapy should have dosage reduced to 220 mg/m² for subsequent courses of ABRAXANE. For recurrence of severe neutropenia or severe peripheral neuropathy, additional dose reduction should be made to 180 mg/m². ABRAXANE should not be administered until neutrophil counts recover to >1.5 x 10⁹/L. For grade 3 peripheral neuropathy hold treatment until resolution to grade 1 or 2, followed by a dose reduction for all subsequent courses of ABRAXANE.

Missed Dose in Metastatic Breast Cancer: ABRAXANE is administered every three weeks. In the event that the next scheduled dose is missed, dosing should occur as soon as possible, consistent with good medical practice, after the missed dose.

What is the likely duration of treatment, if patients respond to treatment?

The median duration of treatment in a US observational study was 4.5 months (3); however the duration may depend on the population to whom treatment is restricted (if any).

Describe the setting that this pharmaceutical would be used in. Is the need for this this treatment limited to a hospital setting, or is it also required in the community? If in hospital, is it theatre only, on medical wards, or in outpatient clinics?

Hospital (administered in outpatient clinics) and community setting (administered in outpatient oncology setting).

If this is a new pharmaceutical, are there likely to be other uses for it?

This is not a new pharmaceutical – it has been registered in New Zealand since 2010. It is being administered currently to patients in New Zealand provided they can afford to pay for treatment. It is also indicated in pancreatic and lung cancer treatment

Treatment initiation

Is treatment with the pharmaceutical started empirically? If so, please describe the symptoms, signs or other features necessary to initiate therapy.

Diagnosis of metastatic breast cancer

Are there any specific tests needed to confirm diagnosis? If so, please name these tests, and say whether these are currently performed routinely, where they take place, and whether they are funded.

Minimal staging workup for MBC includes a history and physical examination, haematology and biochemistry tests, and imaging of chest, abdomen and bone (ESMO Guidelines).

Should other therapies have been used prior to starting treatment with this pharmaceutical? If so, which?

According to the approved indication, patients should have failed treatment with anthracycline therapy. Many patients will have received prior treatments. Treatment choice may depend on which treatments have been received previously. Clinical trials have also investigated first line use of nab-paclitaxel in metastatic breast cancer. Clinical trials in the first line setting to 2017 are summarised in the attached document (4).

Treatment continuation

Treatment continuation

How would treatment success be defined or measured?

Patients would be treated until disease progression

What is the average length of treatment required before determining treatment response?

Response would generally be evaluated depending on the dynamics of the disease, the location and extent of metastatic involvement – generally after 2-4 cycles.

What other interventions would be needed in the event of treatment-related adverse events?

Adverse events reported in >5% patients in MBC trials included neutropenia, anaemia, infections, hypotension, abnormal ECG, cough, dyspnoea, peripheral neuropathy, myalgia/arthralgia, asthenia, fluid retention, nausea, vomiting and diarrhoea. These would be treated as they arise or might necessitate dose reduction.

Prescribing and dispensing

Should initiation of this therapy be limited to certain prescriber types? If so, please explain why.

Medical oncologist

If starting this therapy was limited to certain prescriber types, would it be appropriate for ongoing prescribing to be managed by a wider group of prescribers? If so, who?

No

Are there any other issues that PHARMAC should be aware of in relation to the administration of this pharmaceutical, such as infusion time, compounding requirements or safety issues?

Given by intravenous infusion – the duration of which is 30 minutes. It requires cytotoxic precautions to be taken during preparation and administration.

Health need

Please include full citation details of supporting evidence (eg randomised controlled trials) and attach copies of any cited publications.

What is the health need of people with the indication(s) for which funding is sought? Please include details of whether reduced life expectancy could be expected or details of potential loss of quality of life including the cause of this loss.

Over 3000 people are diagnosed with breast cancer each year in New Zealand and over 600 people will die from this disease.

Is there an unmet health need in the populations that may potentially receive benefit from this treatment? If so, please explain.

Although there have been improvements in rates of survival over the past decades, New Zealand still lags behind some other countries (5). BCAC and other patient groups such as Metavivors NZ are concerned about poorer access to treatment in New Zealand for people with metastatic breast cancer. Although the treatment goals in metastatic breast cancer remain palliative in nature, access to a wider range of treatments that are aimed at controlling symptoms, improving or maintaining quality of life and prolonging survival is needed in New Zealand. For people who have metastatic breast cancer, extension of, and quality of, life are key priorities. BCAC believes that there is an unmet health need in patients with metastatic breast cancer for more treatment options. In addition, treatment choices should particularly take into account interpatient variability, factors that may preclude access to current treatments, time taken to administer treatment and adverse effects.

Are there sub-populations within these populations that have a higher health need?

Māori and Pacific women have poorer survival and are therefore more likely to be affected by metastatic disease as well as having more co-morbidities (6-8). In addition, patients who have residual toxicity from earlier treatments, who cannot tolerate adverse effects of current taxanes without pre-medication (e.g. those with diabetes), patients with triple negative breast cancer, older patients, and those from lower socioeconomic groups have poorer survival statistics and therefore may benefit from a wider range of treatment alternatives. For patients who have been exposed to an anthracycline and/or a taxane in the adjuvant setting subsequent treatment may be problematic due to residual toxicity.

What are the treatments that patients with these indications currently receive, if any? Please describe the dose, duration of treatment, along with the risks and benefits associated with this treatment.

Health need

Taxanes are considered effective cytotoxic drugs and are widely used in treatment of metastatic breast cancer, both in monotherapy and in combination schedules. They have a proven survival benefit compared with other types of chemotherapy. They are agents of choice in patients progressing after anthracycline containing chemotherapy. Both paclitaxel and docetaxel were registered as 3-weekly regimens, but different doses and schedules were developed with the aim of increasing efficacy and decreasing toxicity (9).

Are there any issues regarding the availability or suitability of existing treatments for this indication?

Currently available taxanes are insoluble compounds that require the use of other agents in their formulations to confer solubility suitable for intravenous administration. Current formulations of paclitaxel use polyoxyethylated castor oil (Cremophor) and an ethanol vehicle to allow parenteral administration. Likewise the current formulation of taxol uses polysorbate 80 (Tween 80). These agents are thought to be responsible for the hypersensitivity reactions seen during therapy and may also contribute to other adverse effects including peripheral neuropathy. The use of such formulations also necessitates pre-medication with antihistamines and corticosteroids and 40% of patients of patients will have allergic reactions. The approved datasheets for paclitaxel state that all patients must be premedicated before paclitaxel is administered to prevent severe hypersensitivity effects. Such premedication may consist of dexamethasone 20 mg orally (or its equivalent), approximately **12 and 6 hours** prior to starting the paclitaxel infusion; promethazine 25 mg or 50 mg intravenously or other suitable H1-antagonist, 30 minutes prior to starting the paclitaxel infusion; and cimetidine 300 mg or ranitidine 50 mg by intravenous infusion over 15 minutes, starting 30 minutes prior to the paclitaxel infusion (10). This means that patients must take oral medications prior to clinic attendance and must add 30 minutes to their clinic visit in order to receive pre-meds.

Furthermore, Cremophor causes leaching of plasticisers from PVC bags and infusion sets which requires special non-PVC infusion systems and filtration. The current approved formulations of paclitaxel approved in New Zealand (Ebewe® and Anzatax®) must be diluted to 0.3 to 1.2 mg/mL and it is recommended that they be administered over 3 hours (11).

Would the pharmaceutical replace or complement these existing treatments? Please explain.

The use of nab-paclitaxel would replace current formulations of paclitaxel and taxol for certain patients.

Does this indication disproportionately affect any populations that may already be experiencing a health disparity?

As already stated, the group of patients who would most benefit are those with comorbidities such as diabetes, residual toxicity from prior chemotherapy (12, 13) and those with triple negative breast cancer (14, 15), all of whom have poorer outcomes. Other groups that could be considered are elderly patients (16) and those who would be having more prolonged treatment (9).

Is there an unmet health need in other people due to the indication, such as in people who care for or live with those with the indication, or from spread of disease?

Families and whanau are integral to the patient's life journey at this stage of disease and family members are affected negatively by prolonged times spent in administration and unnecessary adverse effects caused to their loved ones by treatment. Any treatment that reduces this impact needs to be given serious consideration in light of the benefits in these aspects.

Health benefits and risks in the indication(s) for which funding is sought

Please include full citation details of supporting evidence (eg randomised controlled trials) and attach copies of any cited publications.

Discuss the potential benefits from treatment with the pharmaceutical compared with current treatment options (if any).

Nanoparticle albumin-bound paclitaxel (nab-paclitaxel) is a solvent-free colloidal suspension of paclitaxel and human serum albumin that exploits the physiological transport of albumin from the blood stream via the endothelium of the blood vessels. Animal models indicate that trans-endothelial transportation of albumin (in nab-paclitaxel) may contribute to 33% higher intratumoural paclitaxel concentration (17). The nanoparticle delivery system eliminates the need for toxic solvents such as Cremophor and Tween 80, reducing limitations of dosing and affecting efficacy. This system may allow better transport of drug to the tumour microenvironment, thus it is associated with more linear pharmacokinetics. In human studies, pharmacokinetic data show higher volume of distribution and clearance for nab-paclitaxel, corroborating pre-clinical findings (18). The recommended method of administration of nab-paclitaxel is by intravenous infusion over a period of 30 minutes and no premedication is required. Therefore, the duration of clinic attendance can be reduced by 3 hours per patient per dose administered. Clinical evidence of superior efficacy and safety has been demonstrated for nab-paclitaxel versus existing taxanes as follows:

- The efficacy and safety of nab-paclitaxel in the first- and second-line treatment of MBC was demonstrated in a large randomised phase III trial comparing three-weekly (q3w) nab-paclitaxel 260 mg/m² and q3w solvent-based paclitaxel 175 mg/m². That study showed a statistically significant superiority of nab-paclitaxel in terms of overall response rate (ORR) (33% versus 19%, $p = 0.001$; 42% versus 27% in the first-line setting) and PFS (23 versus 16.9 weeks, $p = 0.006$); a trend in favour of nab-paclitaxel for OS was also observed (65.0 versus 55.7 months, $p = 0.046$). Patients randomised to the nab-paclitaxel arm had a lower incidence of grade 4 neutropenia (9% versus 22%, $p = 0.046$) with hypersensitivity reactions being less than 1%, although they did not receive premedication; grade 3 sensory neuropathy was increased with nab-paclitaxel to a rate of 10% compared with 2% of standard formulation ($p < 0.01$), with a median time of improvement to a lower grade of 22 and 79 days, respectively (19).
- A randomised controlled Chinese study also supported these results. In this open-label, multicentre study, 210 patients with metastatic breast cancer were assigned to either paclitaxel 175 mg/m² every 3 weeks or nab-paclitaxel 260 mg/m² every 3 weeks for one to six cycles. Compared with paclitaxel, treatment with nab-paclitaxel was associated with a higher response rate (52 vs 27%) and longer time to progression (TTP) (7.8 vs 5.7 months) without increased toxicity (20).
- A large, randomised, open-label, multicentre compared the safety and activity of weekly (100 or 150 mg/m²) and q3w nab-paclitaxel (300 mg/m²) and docetaxel (100 mg/m²) in 300 women with previously untreated MBC. Findings from this study showed that qw dosing of nab-paclitaxel was associated with a similar tolerability profile to q3w dosing, with no unexpected toxicities reported. The incidence of significant adverse events was significantly higher in the docetaxel group and similarly low across the three nab-paclitaxel groups: grade 4 neutropenia occurred in 5%, 9%, 7% and 75% of patients for nab-paclitaxel 100 mg/m² qw, 150 mg/m² qw and 300 mg/m² q3w, and docetaxel 100 mg/m², respectively, $p < 0.001$; and grade 3 fatigue was reported in 0%, 4%, 5% and 19%, respectively; $p < 0.001$ (21). In terms of efficacy, either dose of nab-paclitaxel was superior compared with docetaxel in terms of ORR and PFS as firstline treatment for MBC. According to the independent assessment, compared with the other treatment groups, the 150 mg/m² qw regimen was associated with a numerically greater ORR (49% versus 35% and 45%, $p = 0.224$) and a significantly longer PFS (12.9 versus 7, at 5 and 12.8 months, $p = 0.0498$). These data therefore suggest that nab-paclitaxel 150 mg/m² qw has a superior therapeutic index compared with q3w dosing for the first-line treatment of women with MBC with median OS reported of 33.8 months rarely seen in this setting (21, 22).
- A post-hoc analysis of two trials using once weekly dosing of nab-paclitaxel was conducted in an older subgroup of patients (≥ 65 years; median: 69). In phase 2 ($n = 52$), overall response rates (ORR) for weekly nab-paclitaxel were 60-64% vs 22% for q3w nab-paclitaxel and 32% for docetaxel. In phase 3 ($n=62$), ORRs were 27% for q3w nab-paclitaxel and 19% for solvent-based paclitaxel. In phase 2, median progression-free survival (PFS) was 18.9 months for 150 mg/m² weekly nab-paclitaxel vs 8.5-13.8 months for all other regimens. In phase 3, median PFS for q3w nab-paclitaxel and solvent-based paclitaxel were 5.6 months and 3.5 months, respectively. Weekly nab-paclitaxel resulted in less serious adverse events compared with all other regimens (16).
- A study in patients heavily pre-treated with taxanes with taxane failure was defined as metastatic disease progression during taxane therapy or relapse within 12 months of adjuvant taxane therapy found response rates of 14% and 16% for the 100-mg/m² and 125-mg/m² cohorts, respectively; an additional 12% and 21% of patients, respectively, had stable disease (SD) \geq or = 16 weeks. Median progression-free survival times were 3 months at 100 mg/m² and 3.5 months at 125 mg/m²; median survival times were 9.2 months and 9.1 months, respectively. Survival was similar for responding patients and those with SD. No severe hypersensitivity reactions were reported. Patients who developed treatment-limiting peripheral neuropathy typically could be restarted on a reduced dose of albumin-bound paclitaxel after a 1-2-week delay. Grade 4 neutropenia occurred in $< 5\%$ of patients. It was concluded that nab-paclitaxel 100 mg/m² given weekly demonstrated the same antitumor activity as albumin-bound paclitaxel 125 mg/m² weekly and a more favorable safety profile in patients with MBC that had progressed with previous taxane therapy. Survival of patients with SD \geq or = 16 weeks was similar to that of responders (12).
- Another prospective, single-center open-label, noncomparative study in MBC patients pretreated with taxanes found an ORR of 23.8%, including one complete response (2.4%) and nine partial responses (21.4%); the disease control rate was 50%. The median duration of response was 7.2 months. After a median follow-up of 9 months, the median PFS was 4.6 months. ORR and PFS were similar irrespective of the previous chemotherapy lines, metastatic sites, and biomolecular expression. Nab-paclitaxel was well tolerated, and the most frequent treatment-related toxicities were mild to moderate (grades 1–2). It was concluded that nab-paclitaxel had significant antitumor activity and a manageable safety profile in patients pretreated with taxanes and experiencing a treatment failure after at least one line of chemotherapy (13). This Italian study also found no deterioration in Quality of Life was experienced by patients receiving nab-paclitaxel in the metastatic breast cancer setting, even in patients pre-treated with taxanes (13)
- Real world evidence from a retrospective analysis of 411 patients receiving second line therapy for metastatic breast cancer (nab-p=109, pac=302) by 1300 breast cancer providers in the USA showed that patients on nab-paclitaxel had significantly less anaemia 26.6% vs 36.8%, $p=0.049$, fatigue (0.5% vs 5.6%, $p=0.023$) and neuropathy 94.6% vs 13.6%, $p=0.039$. Patients on nab-paclitaxel were able to be treated for longer (4.5 months versus 2.8 months, $p<0.01$) and longer time to next treatment (5.9 months versus 4.2 months, unadjusted $p=0.014$, adjusted $p=0.214$) compared with standard paclitaxel (3).

Discuss the potential risks from treatment with the pharmaceutical compared with current treatment options (if any).

One of the primary reasons to use nab-paclitaxel is to reduce risks associated with current treatments. For some patients, this will mean fewer adverse effects associated with life-extending treatments leading to maintenance of quality of life. For others, it will mean being able to access treatment with a taxane – which may have otherwise been contraindicated due to prior toxicity, toxicity associated with the solvents used, or contraindication to the pre-medications that need to be administered from 24 hours beforehand.

Health benefits and risks in the indication(s) for which funding is sought

Are there sub-populations that have higher potential benefits or risks? If so, please describe.

Particular subgroups that may benefit from treatment with nab-paclitaxel include patients who have had prior anthracycline or taxane exposure; patients in whom premedication is contra-indicated (such as people with diabetes). Elderly patients and those with other co-morbidities may also be better able to tolerate treatment.

Would this treatment provide any health benefits or risks to any people beyond the individual who was receiving treatment? If so, what benefits or risks would result?

Benefits to others could involve improved quality of life for the patient being reflected in less stress and worry for family and whanau who are the primary carers.

How would funding the pharmaceutical result in other measurable benefits or risks to the health sector, eg changes in number of surgeries, hospitalisations, nursing time, diagnostic tests?

The administration time for treatment is reduced from a recommended 3 hours for paclitaxel (plus premedication 30 minutes) to 30 minutes resulting in less pressure on outpatient clinic services. There are expected to be better patient outcomes including fewer adverse events necessitating medical care or hospitalisation, as well as reduced medication and administration associated with treatment delivery because of the reduction in pre-medication, special administration requirement and infusion times for nab-paclitaxel compared with current paclitaxel treatment.

Suitability

Please include full citation details of supporting evidence (eg randomised controlled trials) and attach copies of any cited publications

Are there any features of the treatment that may impact on its use (eg method of delivery, size, shape, taste)? If so, please explain.

The formulation is the feature that impacts on administration – no need for pre-meds, shorter administration time, fewer adverse events and better patient outcomes. Because time and quality of life are key priorities, treatment choices should take into account factors such as time taken to administer treatment and the adverse effects associated with treatment.

Costs and savings

Please include full citation details of supporting evidence (eg randomised controlled trials) and attach copies of any cited publications

Would the funding of this treatment create any costs or savings to the health system (eg would treatment require increased monitoring, or would it free up clinician time)?

Nab-paclitaxel is more costly than current taxanes. However, it would also result in savings.

- An Italian economic study found better patient outcomes along with savings in health care resource consumption in pre-medication, preparation, administration and patient surveillance, administration of other drugs, physician and nurses' time and post-medication due to the nab-paclitaxel formulation compared with standard paclitaxel (23).
- A Spanish cost-utility analysis found that nab-paclitaxel was cost-effective compared with 3-weekly paclitaxel and cost saving versus weekly paclitaxel. Treatment was considered consistent with goals of metastatic breast cancer treatment, being extension of life and improvement in its quality. Treatment with nab-paclitaxel resulted in greater QALYs in this analysis and savings accrued due to lower costs associated with administration (24).
- A UK economic analysis using resource use captured during a clinical trial in first line treatment of MBC, from the perspective of the United Kingdom (UK) National Health included costs for chemotherapy, drug delivery, monitoring, supportive care drugs and hospitalisation due to toxicity. Univariate and multivariate regression analyses were conducted to compare the total cost of therapy in patients randomised to each of the four regimens. Growth factor use, hospitalisation due to side effects and toxicity-induced protocol discontinuations were higher in the docetaxel group. When all of the cost components were combined for the entire population (N = 300), patients in the nab-paclitaxel 100 mg/m² weekly and 300 mg/m² q3w groups had comparable average costs to the docetaxel arm (£15,396 vs. £15,809 vs. £12,923; p = NS). The nab-paclitaxel 150 mg/ m² weekly arm had significantly higher overall costs of £27,222 per patient but had a significant improvement in PFS compared to docetaxel. It was concluded that, relative to docetaxel, the incremental costs per progression-free year gained with nab-paclitaxel 100, 150 mg/m² weekly and 300 mg/m² q3w were £5,600, £31,800 and £9,900, respectively. Given its improved safety profile, potentially enhanced efficacy and comparable economic impact, it was concluded by the authors that nab-paclitaxel (weekly or q3w) can be considered a reasonable alternative to docetaxel as first-line chemotherapy for MBC (25).
- Jurisdictions such as Australia, the United Kingdom and Canada have all funded ABRAXANE due to favourable cost effectiveness of treatment. It has been available in most other countries, reimbursed for many years. Currently, ABRAXANE is reimbursed for use in metastatic breast cancer in the following countries: Argentina, Australia, Austria, Canada, Colombia, Czech Republic, Denmark, England, Finland, France, Germany, Greece, Italy, Japan, Netherlands, Northern Ireland, Portugal, Scotland, Slovenia, South Korea, Spain, Sweden, Switzerland, United States and Wales (Data obtained from Celgene, January 2018).



References

1. Specialised Therapeutics. ABRAXANE Datasheet. 2017. p. 1-36.
2. Specialised Therapeutics. ABX 43 - Weekly Dosing of ABRAXANE (nanoparticle albumin-bound paclitaxel) in Metastatic Breast Cancer. 2017.
3. Pelletier C. *Annals of Oncology*. 2016;27 (suppl 6):vi353.
4. Specialised Therapeutics. ABX 47 - Use of ABRAXANE (nanoparticle albumin-bound paclitaxel) as First-Line Therapy for Metastatic Breast Cancer. 2017.
5. Sandiford P, Abdel-Rahman ME, Allemani C, Coleman MP, Gala G. How many cancer deaths could New Zealand avoid if five-year relative survival ratios were the same as in Australia? *Australian and New Zealand Journal of Public Health*. 2015;39(2):157-61.
6. Campbell I, Scott N, Seneviratne S, Kollias J, Walters D, Taylor C, et al. Breast cancer characteristics and survival differences between Maori, Pacific and other New Zealand women included in the Quality Audit program of Breast Surgeons of Australia and New Zealand. *Asian Pacific journal of cancer prevention : APJCP*. 2015;16(6):2465-72.
7. Campbell ID, Scott N, Seneviratne S, Kollias J, Walters D, Taylor C, et al. Breast cancer survival in New Zealand women. *ANZ journal of surgery*. 2015;85(7-8):546-52.
8. Seneviratne S, Lawrenson R, Scott N, Kim B, Shirley R, Campbell I. Breast cancer biology and ethnic disparities in breast cancer mortality in new zealand: a cohort study. *PLoS one*. 2015;10(4):e0123523.
9. Palumbo R, Sottotetti F, Bernardo A. Targeted chemotherapy with nanoparticle albumin-bound paclitaxel (nab-paclitaxel) in metastatic breast cancer: which benefit for which patients? *Therapeutic Advances in Medical Oncology*. 2016;8(3):209-29.
10. Novartis New Zealand. Paclitaxel Ebewe Injection Concentrate Datasheet. 2016.
11. Pfizer NZ. Anzatax Datasheet. 2017.
12. Blum JL, Savin MA, Edelman G, Pippin JE, Robert NJ, Geister BV, et al. Phase II study of weekly albumin-bound paclitaxel for patients with metastatic breast cancer heavily pretreated with taxanes. *Clinical breast cancer*. 2007;7(11):850-6.
13. Fabi A, Giannarelli D, Malaguti P, Ferretti G, Vari S, Papaldo P, et al. Prospective study on nanoparticle albumin-bound paclitaxel in advanced breast cancer: clinical results and biological observations in taxane-pretreated patients. *Drug design, development and therapy*. 2015;9:6177-83.
14. Schettini F, Giuliano M, De Placido S, Arpino G. Nab-paclitaxel for the treatment of triple-negative breast cancer: Rationale, clinical data and future perspectives. *Cancer treatment reviews*. 2016;50:129-41.
15. Specialised Therapeutics. ABX 62 - Use of ABRAXANE (nanoparticle albumin-bound paclitaxel) in Triple Negative Breast Cancer. 2017.
16. Apro M, Tjulandin S, Bhar P, Gradishar W. Weekly nab-paclitaxel is safe and effective in ≥ 65 years old patients with metastatic breast cancer: a post-hoc analysis. *Breast (Edinburgh, Scotland)*. 2011;20(5):468-74.
17. Nyman DW, Campbell KJ, Hersh E, Long K, Richardson K, Trieu V, et al. Phase I and Pharmacokinetics Trial of ABI-007, a Novel Nanoparticle Formulation of Paclitaxel in Patients With Advanced Nonhematologic Malignancies. *Journal of Clinical Oncology*. 2005;23(31):7785-93.
18. Petrelli F, Borgonovo K, Barni S. Targeted delivery for breast cancer therapy: the history of nanoparticle-albumin-bound paclitaxel. *Expert Opinion on Pharmacotherapy*. 2010;11(8):1413-32.
19. Gradishar WJ, Tjulandin S, Davidson N, Shaw H, Desai N, Bhar P, et al. Phase III trial of nanoparticle albumin-bound paclitaxel compared with polyethylated castor oil-based paclitaxel in women with breast cancer. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2005;23(31):7794-803.
20. Guan Z, Feng F, Li QL, Jiang Z, Shen Z, Yu S, et al. Randomized study comparing nab-paclitaxel with solvent-based paclitaxel in Chinese patients (pts) with metastatic breast cancer (MBC). *Journal of Clinical Oncology*. 2007;25(18_suppl):1038-.
21. Gradishar WJ, Krasnojon D, Cheporov S, Makhson AN, Manikhas GM, Clawson A, et al. Significantly longer progression-free survival with nab-paclitaxel compared with docetaxel as first-line therapy for metastatic breast cancer. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2009;27(22):3611-9.
22. Gradishar WJ, Krasnojon D, Cheporov S, Makhson AN, Manikhas GM, Clawson A, et al. Phase II trial of nab-paclitaxel compared with docetaxel as first-line chemotherapy in patients with metastatic breast cancer: final analysis of overall survival. *Clinical breast cancer*. 2012;12(5):313-21.
23. Lazzaro C, Bordonaro R, Cognetti F, Fabi A, De Placido S, Arpino G, et al. An Italian cost-effectiveness analysis of paclitaxel albumin (nab-paclitaxel) versus conventional paclitaxel for metastatic breast cancer patients: the COSTANza study. *Clinicoecon Outcomes Res*. 2013;5:125-35.
24. Alba E, Ciruelos E, Lopez R, Lopez-Vega JM, Lluch A, Martin M, et al. Cost-utility analysis of nanoparticle albumin-bound paclitaxel versus paclitaxel in monotherapy in pretreated metastatic breast cancer in Spain. *Expert review of pharmacoeconomics & outcomes research*. 2013;13(3):381-91.
25. Dranitsaris G, Coleman R, Gradishar W. nab-Paclitaxel weekly or every 3 weeks compared to standard docetaxel as first-line therapy in patients with metastatic breast cancer: an economic analysis of a prospective randomized trial. *Breast cancer research and treatment*. 2010;119(3):717-24.