

Central Australian Renal Working Group.

Decentralising Dialysis.

**Estimated costs
for the
establishment and maintenance
of a haemodialysis unit
in Tennant Creek.**

Prepared by

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Preamble.

This document has been prepared on behalf of the Central Australian Renal Working Group for consideration by the Tennant Creek Renal Committee. The document contains the estimated costs for the establishment and maintenance of a Haemodialysis Unit. In addition, there are aspects to be considered in the design of a Haemodialysis Unit (Refer Appendix J).

The estimates do not include some of the costs of the various departments and community supports required to service the clients and staff undergoing haemodialysis. Indirect costs not calculated are listed on Page 5.

The estimates for staffing on page 5 are for a Registered Nurse, Aboriginal Health Worker and relief personnel only. They have been calculated at the highest (THS) rate. Page 7 details the other staff required to support the functioning of a Haemodialysis Unit. The inclusion of these staff in the final estimates would depend on where the Unit is situated, eg. contract cleaners would be required for a stand alone facility at some distance from a health service as opposed to using existing staff.

Pathology costs have not been included in the estimates. This will have to be reconsidered should the service be established on the Tennant Creek Hospital campus. (Refer Appendix H)

There have been a number of assumptions made in the preparation of this information. These assumptions are as follows:

1. Initially, the Tennant Creek Haemodialysis Unit (TCHU) will cater for a maximum of four clients during a morning shift. The Unit will be staffed by a Registered Nurse and an Aboriginal Health Worker.
2. The Aboriginal Health Worker employed to work in the Haemodialysis Unit will be available to work evening shifts and public holidays.
3. Two other staff within the organisation will have dialysis training and be available to act as Relief personnel.
4. All staff working in the Unit will undergo a 4 month training program in the Alice Springs Renal Service. Ongoing education and support will be provided by the Alice Springs Renal Outreach Team.
5. During the second year, the service will open a second shift. This second shift will be staffed by a Registered Nurse and an Aboriginal Health Worker. Both of these staff will require a 4 month training period.
6. The equipment and disposables are purchased from the wholesaler by the Haemodialysis Unit. (Another option is the negotiation of a 'price per treatment' agreement between a machine manufacturer and health service. This is a common practice and generally the PPT agreement covers lease of machines as well as the purchase of consumables.)
7. PBS medications are obtained from a local pharmacy (and not the Hospital Pharmacy).
8. The equipment is serviced through the Biomedical Engineering Department of the Alice Springs Hospital. (However, a common practice is the negotiation of a service agreement with the equipment provider. This service agreement may or not be part of a PPT agreement.)

Estimated capital costs are currently being prepared by the Project Officer, Property and Works Section, Territory Health Services (Darwin). He has been requested to assess a standard 3 bedroom home in Tennant Creek and a tin shed at Anyinginyi Congress. As a space becomes available within the Tennant Creek Hospital campus he will assess that also. The recent construction of a stand alone unit on Bathurst Island may act as a guide for a similar development in Tennant Creek.

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Start up costs

Equipment - haemodialysis

Item	Cost (\$) (each)
(Fresenius) haemodialysis machine (4 @ 18,500 each)	74,000
Reverse osmosis module (4 @ 6,500 each)	26,000
Total	100,000

Equipment - miscellaneous

Item	Cost (\$)
recliner chairs (4 @ 600 each)	2,400
dressing trolleys (4 @ 175 each)	700
staff stools (2 @ 285 each)	570
tourniquet (4 @ 5 each)	20
line clamps (\$1.50 each, 6 required per client)	36
scales (digital bathroom)	300
glucometer and assoc. equipment	250
sphygmomanometer (4 @ 46 each)	184
fridge (pathology and medications)	600
entertainment (television, video, headsets, radio)	5,000
wheelchair (with solid tyres)	1,000
kitchen equip (fridge, microwave, toaster, kettle, crockery, cutlery)	600
Total	11,660

Equipment - cleaning

Item	Cost (\$)
linen skip	300
range of bowls and kidney dishes	20
mop, bucket, broom and dust pan	40
rubbish bins (selection)	60
equipment trolley	660
maxibin trolley with bins (P40 by 10, P39 by 10, P20 by 20)	824
dialysate trolley	385
Total	2,289

Equipment - office

Item	Cost (\$)
computer desk with drawers	455
ergonomic chair	280
4 drawer filing cabinet	260
bookcase	185
phone/fax machine	460
photocopier	2,000
calculator	15
clocks (2 @ 25 each)	50
Total	3,705

Total (establishment costs):

\$117,654

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Recurrent Costs.

Year	1999/2000	2000/2001
Client numbers	4	8
Sessions/year	156	312
Treatments/year	624	1248
Salaries	119,648	181,576
Travel	14,836	8,116
Communications	5,080	5,570
Power and maintenance	5,526	6,016
Treatment costs		
Consumables (@ \$70)	43,680	87,360
Medications (@ \$3)	1,872	3,774
Food (@ \$3.50)	2,184	4,368
Linen (@\$1)	624	1,248
Sub Total	48,360	96,750
Total	193,450	298,028

Indirect costs (not calculated)

- Executive support
- Nursing and Medical Administrative support
- Human Resources
- Finance/Accounts
- Library
- Hospitalisation of clients
- Social support/monitoring of clients
- Patient travel

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Appendix A.

Salaries	year 1	year 2
<u>RN Level 2 -</u>		
AM shift		
salaries (0.6 EFT @ \$44,035)	\$26,421	\$26,421
on costs (52% @ \$26,421)	\$13,738	\$13,738
penalties (public holidays, 11/year @ 50%)	\$1,050	\$1,050
relief		
salaries (6 wks @ 0.6 EFT)	\$3,048	\$3,048
PM shift		
salaries (0.6 EFT @ \$44,035)		\$26,421
on costs (52% @ \$44,035)		\$13,738
penalties (\$26,421 @ 15%)		\$3,963
penalties (public holidays, 11/ year @ 50%)		\$1,050
relief		
salaries (6 wks @ 0.6 EFT)	\$3,048	\$3,048
<u>AHW Class 3</u>		
AM shift		
salaries (0.6 EFT @ \$40,106)	\$24,063	\$24,063
oncosts (52% @ \$24,063)	\$12,513	\$12,513
penalties (public holidays)	\$893	\$893
relief		
salaries (6 wks @ 0.6 EFT)	\$2,776	\$2,776
PM shift		
salaries		\$24,063
oncosts (@ 52%)		\$12,513
penalties (shift allowance)		\$3,609
penalties (public holidays)		\$893
relief		
salaries (6 wks @ 0.6 EFT)		\$2,776
<u>recruitment</u>	\$5,000	\$5,000
<u>Training</u>		
RN Level 2 (relief position)		
salaries (2.0 EFT @ \$44,035 for 16 weeks)	\$27,098	
Sub total	\$119,648	181,576

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Salaries

Other

Allied Health

Social Worker - P2 @ 3 hrs/week @ \$28/hr

\$4,368

\$4,368

Nutritionist - P2 @ 0.5 hrs/week @ \$28/ hr

\$728

\$728

Clerical

1 hr per day @ \$13.50/hr

\$2,106

\$2,106

Cleaner/PSA

2 hrs per day @ \$13.50/hr

\$4,212

\$4,212

Medical Support (Medical Registrar)

3 hrs per week

\$6,006

\$6,006

Total

\$17,420

\$17,420

Appendix B.

Travel

	year 1	year 2
Training		
<u>RN level 2</u>		
• Dialysis Training in Alice Springs accommodation (@ \$60/week for 16 weeks)	\$960	\$960
travelling allowance (@ \$137.60/week for 16 weeks)	\$2,201	\$2,201
airfare	\$199	\$199
<u>AHW</u>		
• Dialysis Training in Alice Springs accommodation (@ \$60/week for 16 weeks)	\$960	\$960
travelling allowance (@ \$137.60/week for 16 weeks)	\$2,201	\$2,201
airfare	\$199	\$199
<u>RN (level 2)</u>		
• Relief accommodation (2 @ \$60/week for 16 weeks)	\$1,920	
travelling allowance (2 @ \$137.60/week for 16 weeks)	\$4,402	
airfare (2 @ \$199)	\$388	
Sub Total	\$13,440	\$6,720
Service		
<u>Technical Support</u>		
5 days, twice a year.		
accommodation (5 nights @ \$65 per night)	\$650	\$650
travelling allowance (\$58.60 per 24 hours)	\$586	\$586
fuel (\$80/trip)	\$160	\$160
Sub Total	\$1,396	\$1,396
Total	\$14,836	\$8,116

Appendix C.

Communications	year 1	year 2
telephone rental (@ \$50/month)	600	600
phone calls (@ \$30/month/shift)	360	720
computer	2,000	2,000
cc:mail and E:mail	120	250
stationary	2,000	2,000
total	5,080	5,570

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Appendix D.

Consumption and maintenance

Consumption	annual cost
haemodialysis machines use 3.5 Kwatts of power* cost 17c/Kwatt	\$280
water use 650 litre/treatment cost (Gov. rates) 70c/K litre	\$210
computer, lights and air conditioner	\$600
Water treatment - replacement	
reverse osmosis module filters	\$900
carbon filters	\$150
particle filters (2 @ \$40/fortnight)	\$2,080
salt	\$416
Water tests	
biochemistry (6 monthly per machine)	\$60
bacteriology (monthly per machine)	\$430
chemical (3 monthly for the Unit)	\$400
Total	\$5,526

* covers preparation for treatment, a 5 hour treatment and disinfection.

Appendix E.

Consumables

Cannulation of fistula

connection		disconnection	
item	cost (c)	item	cost (c)
'bluie'	.5	'bluie'	.5
basic pack	57	gauze (2)	32
20 ml syringe	23	tape	20
2 ml syringe	7	bandaids	40
needles, hypodermic	.06		
tape	20		
solution	90		
fistula needles (2)	190		
gloves	.12		
apron	12		
total cost	399.68	total cost	92.5

Vascular catheter

connection		disconnection	
item	cost (c)	item	cost (c)
'bluie'	.5	'bluie'	.5
gauze	32	gauze	32
povidone iodine solution	87	basic pack	57
basic pack	57	2 ml syringes (2)	14
2 ml syringes (2)	14	10 ml syringes (2)	32
10 ml syringes (2)	32	needles, hypodermic (2)	.06
needles, hypodermic (2)	.06	catheter caps (2)	136
sterile gloves	36	sterile gloves	36
apron	12	Persist plus	39
		IV3000 (2)	56
total cost	271	total cost	423

machine

item	cost (\$)
blood lines (Fresenius)	9.50
dialyser	18.00
infusion set	2.33
recirculator	.75
normal saline, 1000 mls (2)	2.66
solutions (acid and bicarb. Acid component includes dextrose.)	21.50
10 ml syringe	.16
Citrosteril	3.14
cleaning (daylee towel and soapy water)	.01
rubbish bag	.02
total cost	\$58.07

Total Cost/treatment

fistula	\$63.00
vascular catheter	\$65.00

average/treatment

plus 5% wastage factor	\$64.00
	\$70.00

Appendix F.

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Medications

Non PBS pharmacy items are as follows:

- solutions (Betadine and Chlorhexidine)
- vitamins
- phosphate binders
- heparinoid ointments
- some eyedrops

and would need to be provided by the Hospital Pharmacy Department.

Estimated costs

Average per client per treatment

PBS items are as follows:

- anticoagulants
- antihypertensives
- antibiotics
- saline ampoules
- miscellaneous

and therefore would be available through the community pharmacy for the cost of a \$3.20 per item to a maximum of 52 items/year.

Maximum cost for 52 items @ \$3.20 per item = \$166.50

Average per treatment = \$1.10

Total cost per client per treatment: \$3.00

Appendix G.

Food.

Item	Cost per treat/client
sandwich	2.50
toast, butter, jam, tea, milk, sugar	1.00
Total	3.50

Appendix H.

Linen.

Item	Replacement cost (each)	Laundering cost per treat/client
sheets	16.00	\$1.00
blankets	15.50	
pillow slips	3.45	
pyjamas	30.00	
wash cloths	0.73	
towels	4.69	

The experience in Alice Springs is as follows:

1. pyjamas/nightgowns are used
 - by clients who choose to shower before treatment. They wash their clothes and then leave them to dry in the sun.
 - in the event of a large blood spill on clothing.
2. sheets, pillow slips and 1 - 2 blankets are used each treatment routinely.
3. towels are used as small pillows, limb props and as is routine in other areas.

Thus far, the Renal Unit has not had to pay for anything more than the laundering of the items used. However, the Laundry are considering that the Unit should pay for (replacement of) the articles as well as the laundering charges.

Appendix I.

Pathology

All pathology items processed by accredited Pathology Services are covered by the Medicare rebate. The referral pathology centre does not charge for low volumes of HTLV-1 and HIV testing*.

Tennant Creek Hospital Pathology Department is not accredited and so charges do apply. The following are an estimation only.

Routine investigations		Rebate*	Est. cost*	Annual
Monthly	renal panel	16.85	3.50	42
	full blood count	14.65	.37	4.50
3 monthly	PTH	26.85	13.00	52
	HbA1c (for diab. clients)	14.15	1.50	6
	iron studies	31.20	4.50	18
	B12/folate	20.70	3.00	12
6 monthly	Hep B/C	21.00	7.00	14
	HIV		7.00	14
	HTLV - 1		7.00	14
12 monthly	Al/Cu	30.05	13.00	13
	zinc	20.70	13.00	13.
	serum lipids	9.70	4.50	4.50

Collection equipment

Vacutainer holders (ea)	.11
Vacutainer needles (ea)	.05
Vacutainer tubes, 2 ml (ea)	.02
Vacutainer tubes, 5 ml (ea)	.18

* Source - Western Diagnostic Services, Western Australia.

* Source - Frank Holland, Tennant Creek Hospital Pathology Department.

Appendix J.

Space Recommendations.*

Dialysis area

allow

- 3m² per dialysis station.
- dialysis consumables storage nearby
- waste and dirty linen holding area
- 1 scrub basin per 4 clients

Nursing administrative area in main treatment area

- desk space - allow for telephones, computer, printer, fax, filing cabinets.
- office space for administrative tasks.
- A4 folder space.

Dirty utility areas

- access to cleaning facilities.
- occasional need for pans/urinals and therefore a pan flusher is essential.
- waste disposal - contaminated, general, sharps and linen.

Clean utility areas (part of the main dialysis area)

- bench space for preparation
- storage areas for small consumables
- pharmacy and pathology fridges
- locked drug cupboard space

Storage area

- pallet access (approx. 1 pallet delivered per fortnight)
- weekly delivery from stores to dialysis area
- shelving to be designed for accommodating heavy items, eg. 5 litre bottles.
- smaller items to be kept in shelving close to the Nurses Station in the treatment area.

Patient toilets

- to include disabled access
- situated close to treatment - occasionally clients are disconnected mid treatment.

Patient waiting area

- requires wheelchair access
- for patients pre and post treatment
- staff to be able to monitor area (relevant for clients post treatment)
- optional - access to taxi phone
- optional - tea and coffee making facilities

Staff tea room

Staff toilets

For consideration in future development:

- medical/treatment room
- education/resource room
- isolation of (respiratory) infectious clients

* For more information - please refer to *Guidelines for Satellite Dialysis Units, Victoria*, unpublished. March 1998.

Technical Recommendations.

Power supply

- Class B standard, 4 by 240 volts with residual (10 mA) current device protection.
- 10 A supply for each machine.
- each machine is to be wired separately.
- optional - generator. Each machine has a minimum of 10 mins battery backup. This is sufficient to complete treatment. However, where there are staffing restriction (and staff are not available at other times), it may be necessary to have power to complete the treatment during the scheduled shift.

Water supply

- for more than 6 machines, consideration should be given to the installation of one central RO to supply all machines.
- plumbing outlets should be for the estimated number of machines plus one for maintenance/service.
- each point requires tundish for drains to sewer.
- plumbing needs to be high temperature PVC or stainless steel.
- suggest consultation with gambro Australia P/L (acknowledged experts in water treatment for dialysis).

Portable or piped oxygen

Floor surfaces

- non slip vinyl covered up to wall (to allow for frequent blood and dialysate spills).

Wall surfaces

- smooth, flat surfaces for easy cleaning (in the event of blood splashes).

Lighting

- as much natural lighting as possible.
- require spotlights above dialysis stations to ensure adequate light for cannulation.
- emergency lighting

Entertainment

- television with optional video with individual headsets/speakers and option of radio

Controlled ventilation

- heating and air conditioning is essential

Telecommunications

- telephone extensions, fax and computer cabling
- public phone access for patients is highly desirable
- nurse call system
- link in with agency PA system
- emergency connections

Security

- fire safety
- security lighting
- security monitoring/systems

Other Considerations

A) Establishment of Unit

- staff:patient ratio
- AHW:RN ratio
- patient selection criteria
- medical support
- management structure of unit (to include client representative)
- organisational support and professional development of staff

B) Social Support

- transport to and from treatment
- accommodation of clients
- support services and monitoring of clients in accommodation



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Dr Helen Carney
Anyinginyi Congress Aboriginal Corporation
PO Box 403
TENNANT CREEK NT 0861

Dear Dr Carney

Thank you for forwarding me a copy of your letter of 8 July 1999 to the Hon Tim Fischer MP concerning renal services at Tennant Creek.

The development of viable dialysis services at locations which will increase access for people requiring this treatment is a high priority for the Northern Territory Government.

A preliminary study of the situation in Central Australia focussing on the Barkly has already been carried out. On the basis of this information, Territory Health Services staff in the Barkly District are currently developing a proposal for a Renal Dialysis Unit being located at Tennant Creek. This will include consultation with stakeholder groups, and the input of Anyinginyi will be central to this.

At this stage it is envisaged that a submission will be finalised for consideration in the next round of hospital development funding before the end of the year. Unfortunately, until the outcome is known about the submission it is not possible to provide a more definite answer to your request.

Thank you for your interest in this matter.

Yours sincerely

STEPHEN DUNHAM

19 AUG 1999

