

Auckland Regional Public Health Service

Rātonga Hauora ā Iwi o Tamaki Makaurau



Working with the people of Auckland, Counties Manukau and Waitemata

Health & Safety Guidelines for Early Childhood Centres

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1. Introduction

This document is intended as a guide for early childhood centre operators whose centre is to undergo a health and safety assessment by Auckland Regional Public Health Service (ARPHS). It details the public health and safety issues that commonly arise from the assessment of early childhood centres (ECCs) and provides the relevant standards that ECCs must meet. The Ministry of Education (MinEd) considers the health and safety assessments of ECCs by the Ministry of Health's designated officers, essential in the provision of quality early childhood education.

ARPHS performs health and safety assessments of ECCs in the following circumstances:

- At the request of ECCs for the health report required by the MinEd before a licence can be granted.
- At the request of the MinEd as part of its ECC relicensing programme to assess ongoing compliance with licence requirements.
- In circumstances where a significant concern about an ECC has been raised by the MinEd or another party.

In each instance, the MinEd is provided with a copy of the health and safety assessment report produced by the Auckland Regional Public Health Service.

ARPHS has the mandate to perform ECC health and safety assessments from the Ministry of Health, as the Director-General of Health's nominated officers. The Director General of Health's legislative mandate comes from the MinEd as stated in the Education (Early Childhood Centres) Regulations 2008, r 9(2) (Additional requirements where application relates to centre):

Every application for a licence in relation to a new centre must be accompanied by a report from the Director-General of Health or a person nominated by the Director-General of Health for that purpose, assessing whether-

- (a) Relevant aspects of the premises and facilities standard set out in regulation 45 and the relevant aspects of the health and safety practices standard set out in regulation 46 is likely to be, complied with; and*
- (b) The premises and facilities to be used by the centre are suitable for use as a centre.*

And r 55 (Secretary may request health reports):

In determining whether the premises and facilities standard set out in regulation 45 or the health and safety practices standard set out in regulation 46 has been or is likely to be complied with, the Secretary may direct the service provider of a licensed service to obtain a report from the Director-General of Health or a person nominated by the Director-General of Health for that purpose.

The Ministry of Health's operational instructions to public health units for performing ECC health and safety assessments are provided in section nine (early childhood centres) of the *Environmental Health Protection Manual*. ARPHS reports our findings to the Ministry of Education which considers our recommendations and determines what (if any) actions must be taken by the ECC service provider before granting an ECC licence. Health and safety assessments cover compliance with legislative requirements, including health and safety standards required by the Education (Early Childhood Centres) Regulations 2008 r 45, 46 and 57 (appendix 1) and the assessment of health risks. This document contains the specific health and safety issues that will be considered at the assessment, along with the standards ECCs are required to meet for each issue, where relevant.

What can be expected from Auckland Regional Public Health Service (ARPHS):

- A health and safety assessment of the premises, that covers the issues outlined in this guide. It also includes reviews of any applicable health and safety procedures and policies the centre has (refer to *Nga Kupu Oranga*).
- ARPHS aims to undertake assessments within 20 working days of receiving the request and making an appointment.

- The health and safety report is available within 7 working days following assessment. This report will include recommendations to the service provider regarding health and safety issues. The report is also sent to the Ministry of Education as part of its requirement for consideration of the centre's licence.
- The health and safety assessment is a 'user pays' service – and upon completion of the final report, the service provider will be sent an invoice.

What is expected from the service provider:

Please refer to this guideline and ensure that you meet the requirements prior to the assessment and discuss it with the officer at the actual time of assessment. At the time of the assessment it is expected that the centre will be, as it is on the opening day:

- any building work, renovations, etc must be completed
- all facilities must be in place
- health and safety policies and procedures must be available for review

It is important that your centre is ready for the health and safety assessment when we visit. If the centre is not ready, we will not be able to complete the health and safety assessment and we will charge for two visits.

If you have any questions regarding this document please contact ARPHS and ask to speak with the Early Childhood Centre Single Point of Contact (refer appendix 2).

We hope that this information is useful and welcome your feedback and any suggestions for improvement.

2. Play Area

2.1 Building Act, Regulations and Codes

The Building Act 2004 (appendix 3) and subsequent regulations in some cases superseded the Education (Early Childhood Centre) Regulations 2008 (appendix 1). Auckland Council, (appendix 3) Building Inspectors are responsible for administering the Building Act, however, the Health Protection Officer may comment on areas covered by this Act if any deficiencies are observed during the assessment of an early childhood centre.

The following text refers to the *New Zealand Building Code Handbook and Approved Documents* made under the Building Act 2004. Centres should ensure that they comply with the Act and subsequent Regulations.

2.2 Lighting

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF12
Building Code G7.2 and G7.3.1

Habitable spaces shall be provided with adequate openings for natural light and for a visual awareness of the outside environment (Building code G7.2). Natural light shall provide a luminance of no less than 30 lux at floor level for 75% of the standard year (Building code G7.3.1)

In the absence of sufficient natural light please refer to the Australian/New Zealand Standard 1680: 2006 *Interior and workplace lighting Part 1: General principles and recommendations*. This document provides general principles and recommendations for the lighting of interiors of buildings for performance and comfort. This standard recommendation a level of 240 lux 0.75 metres from the ground. Children playing at floor level as well as 3-5 years olds learning letters/numbers etc in a mat situation need good lighting.

2.3 Ventilation

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF12
Building Code G4.2

There must be adequate ventilation in every room in the centre that is used by children. The objective of the building code provisions on ventilation is to safeguard people from illness or loss of amenity due to lack of fresh air.

Adequacy of ventilation under the building code is measured through air change rates. An air change rate is a measure of how quickly the air in an interior space is replaced by outside (or conditioned) air by ventilation and infiltration. Air change rates are measured in cubic metres per hour divided by the volume of air in the room, or by the number of times the dwelling's air changes over with outside air. For example, if the amount of air that enters and exits in one hour equals the total volume of the heated part of a dwelling for example, the dwelling is said to undergo one air change per hour. A recommended figure for ECEs is a minimum of 3 air changes per hour.

2.4 Heating

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF12, HS24
Building Code G5.2.1.a, G5.3.1, and G5.3.2.

The building should be constructed to provide an adequate, controlled, interior temperature. Habitable spaces, bathrooms and recreational rooms should have a maintained internal temperature of at least 16°C measured at 500mm above the floor.

Specific concerns with regard to prevention of burns should be addressed by centres. All heating devices used in centres should be either incapable of burning children, or inaccessible to them. Preferred heaters are those that are permanently wired and wall mounted above a child's reach.

When contemplating a heating system it is recommended that consideration be given to heating systems that do not produce or contribute to indoor air-pollution. Such systems include flued gas heaters or central heating that carry the pollutants outside or alternatively electric heaters or reverse cycle air conditioner units.

ARPHS does not support the use of unflued gas heaters. These heaters release nearly two kilograms of water for every kilogram of gas burnt. Moisture rapidly builds up in the room being heated, leading to the growth of moulds and dust mites, impacting on the health and well being of children. There is also the danger of asphyxiation from using this form of heating in an unventilated area and the adverse health impacts of inhaling nitrogen oxides. To combat these effects the recommended use involves an open window – this undermines their heating value.

2.5 Noise

Licensing Criteria for Early Childhood Education and Care Centres 2008, HS15 Building Code G6.

Acoustic design must ensure that noise is kept to a reasonable level especially in areas designated for rest or sleep. Constant high levels of noise in playrooms can also have an impact on stress levels and child well being, and adequate floor coverings and wall linings can help reduce this stress.

The following recommendations, based on the World Health Organization's 'Guidelines for Community Noise' (<http://whqlibdoc.who.int/hq/1999/a68672.pdf>), are provided as guidance for the interpretation of 'reasonable level' of noise:

Recommended maximum noise exposures in Early Childhood Environments

Environment	Potential Health Effects	Leq (dBA)	Time (hours)	Lmax (dBA fast)
Pre-school, Bedroom indoors	Sleep disturbance, sleeping hours	30	Sleeping time	45
School classrooms	Speech interference, disturbance of information extraction and message communication	35	During class	-
School, Playground outdoor	Annoyance (from an external source)	55	During Play	-

LAeq [dB] = Level for 'A-frequency weighted' sound averaged over a time period

LAmx, fast [dB] = Maximum sound level for 'A-frequency weighted' fast sound (i.e. for a single sound event)

The Health Protection Officer will evaluate internal sources of noise during the health and safety assessment and consider measures taken to reduce the impact of noise on the children. Assessing noise could be included as part of a follow-up assessment of the centre, i.e. when children are present.

2.6 Art sink

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF10

If children have access to an art sink the water temperature should be no higher than 40°C. Robust cleaning and sanitising procedures are needed to ensure that facilities such as cleaner's sinks, laundry tubs or kitchen sinks and benches are thoroughly cleaned and sanitised before and after being used for art preparation and clean up.

- Due to the risk of cross-contamination from body waste, body wash facilities must not be used for art preparation and clean up.

- It is preferable that the art preparation and clean up facility is a separate plumbed in sink or tub unit that is used exclusively for this purpose. Locating this facility close to existing plumbing e.g. near or backing onto the kitchen or laundry is often most practical and cost-effective.
- If a dedicated art sink is not possible at the centre, the service provider will need to have an acceptable alternative system in place. Alternative systems may include:
 - Using one or more buckets to wash materials, and disposing the waste water in the cleaner's sink or down an outside gully trap
 - Placing an insert into a sink facility used for another purpose to prevent art materials from coming into contact with any cleaning waste or chemical residues, and/or to prevent paint or waste water from coming into contact with the sink.

2.7 Animals

Licensing Criteria for Early Childhood Education and Care Centres 2008, HS16

Centre managers should only allow clean, healthy, and easily restrained animals on the premises. Dogs, chickens and cats are not acceptable as their faecal material may contain pathogenic organisms and contaminate the premises. Turtles are also not acceptable in centres as they are known to carry *Salmonella* spp.

Animals that are suitable and can be kept at early childhood centres (provided that they are kept in a suitable state of hygiene) include guinea pigs, rabbits, mice, rats, fish, frogs and tadpoles, lizards and small birds.

Centres that have, or intend to have, animals on the premises should produce a policy that outlines how the centre will:

- Ensure that the animals are supplied with a good, healthy living environment;
- Maintain living conditions to a high standard of cleanliness;
- Store animal food so that it is clearly distinguishable from human food;
- Ensure that children having had contact with animals immediately wash their hands under supervision; and
- Quarantine sick animals away from children.

There is a requirement under the Animal Welfare Act 1999 to ensure that the physical, health, and behavioural needs of animals are met. Under this Act the onus of care lies with the owner or person in charge of an animal to ensure these needs are in accordance with both good practice and scientific knowledge.

3. Kitchen and dining area

3.1 Drinking Water Supply

Licensing Criteria for Early Childhood Education and Care Centres 2008, HS21

Centres are required to provide a potable (safe and wholesome) supply of drinking water to children attending the centre at all times. For the water to be potable it must comply with the Drinking Water Standards New Zealand 2005 (DWSNZ 2005) (appendix 4). Town or city water supplies generally meet these standards and are not regarded as a significant problem. Centres that collect their own drinking water are required to take steps to safeguard the water supply:

- Drinking-water of potable quality must be freely available to children at all times.
- Drinking water from a non-treated supply (e.g. roof water, bore water etc) can only be considered potable if it meets the DWSNZ 2005, which sets out the compliance monitoring and testing requirements applicable to all community supplies for more than 25 people. This means that section 10 of the *Drinking-Water Standards for New Zealand 2005 (revised 2008)* (MoH, 2005a) would apply

to them. To comply with the Standard, the supply would be required to prepare and implement a Public Health Risk Management Plan. Further information on preparing a public health risk management plan can be found in the Ministry of Health's publication *Small Drinking-water Supplies: Preparing a public health risk management plan* (MoH, 2005b).

Should a centre require assistance with the above mentioned points to contact ARPHS' drinking water assessment unit (appendix 2).

3.2 Nutrition

Licensing Criteria for Early Childhood Education and Care Centres 2008, HS19

Centre managers, supervisors, teachers, cooks and parent helpers should encourage and promote healthy eating. It is recommended that the licensee has a nutrition policy, including breastfeeding policy in place that incorporates the key principles of good childhood nutrition and for supporting breastfeeding. The centre's nutrition policy should be designed in accordance with *Food and Nutrition for Healthy Confident Kids: Guidelines to Support Healthy Eating Environments in New Zealand Early Childhood Education Services* (MoE, 2007a) and *Schools, Food and Beverage Classification System for Early Childhood Education Services* (MoE, 2007b), *Food and Nutrition Guidelines for Healthy Infants and Toddlers (Aged 0-2): A background paper* (MoH, 2008) and *Nga Kupu Oranga* (appendix 5)

Some key points have been included below.

General nutritional considerations applicable to early childhood centres (where food is provided) should include the following:

- ECC services should provide a variety of nutritious foods from each of the four major food groups
- Children should drink plenty of liquids and have access to water at all times
- Children aged 2-5 years should be provided with reduced fat milk
- ECC services have a role in helping to create a culture of healthy eating and to help children develop healthy eating behaviours
- Procedures and processes should be in place to manage children affected by food allergies or intolerances. Parents/carers should be consulted and given the opportunity to express dietary preferences for their children. A team approach (with the child's family, doctor and/or dietician) should be used to ensure the child does not receive allergens while at the centre
- The menu should provide foods which fit with the food and beverage classification system with 'everyday' foods dominating the menu (refer to the *Food and Beverage Classification System User Guide and Recipe Book*, Ministry of Health 2007)
- "Occasional" foods and drinks that are high in energy, saturated fat and/or salt should be limited and served only once per term (or four times per year)
- Menus should be made available for parents to inspect and should be reviewed if necessary
- Children should be provided with food that has been stored, prepared and served safely and hygienically.

There are special considerations for babies and toddlers (0-2 years):

- Until an infant is 6 months old, breast milk or infant formula will supply all the nutrients they need
- Breast milk or infant formula remains the most important nutrient source for the first year of life. Complementary foods should be introduced at around 6 months of age. The variety and texture of foods offered should be increased as the child reaches 12 months
- Breast milk provides optimal nutrition for babies and ECC services should provide an environment that is supportive of breastfeeding. It is a Ministry of Health requirement that refrigeration space for expressed breast milk is provided. Mothers should be encouraged to provide expressed breast milk. Otherwise, infant formula should be used until 12 months (parents or guardians must approve the formula before use)
- Babies and toddlers should be offered fluids regularly to prevent dehydration (and more frequently in hot weather). Breast milk or infant formula will provide fluid needs until 7 months of age, after this time water can be introduced
- Children aged 1-2 years should be provided with full-fat whole milk and water as their main fluids.

For further information refer to Ministry of Health documents:

- Eating for Healthy Babies and Toddlers from Birth to 2 Years Old
- Eating for Healthy Children Aged 2 to 12

Centres are required to maintain a record (for up to three months after the food is served) of all food provided by the service, showing the type of food provided to the children. This record must be available for inspection by the designated officer. The record should indicate that the food served is consistent with the nutrition policy and menus.

The Healthy Heart Award provided by the New Zealand Heart Foundation, is a free-of-charge programme that encourages early childhood centres to promote healthy eating and active movement to the under fives and their families. The programme provides early childhood centre staff with nutrition and active movement information, planning tools and curriculum guides, to assist with the implementation of healthier food choices and active movement. For further information refer to the following website <http://www.nhf.org.nz/index.asp?pageID=2145820300>

3.3 Food Safety

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF16 and HS20

Food safety is an area of significant public health concern. If centres provide food it should be clean and safe. Centres are required to provide 'safe' food and this can only be reasonably assured if an auditable food safety plan is in operation on the premises. *Officers should focus inspections on key food safety risk areas and promote the development of Food Safety Programmes in line with current New Zealand Food Safety Authority guidelines.*

ECC's can be divided into three categories regarding food provision:

- 1 - Centres that prepare food on site
- 2 - Centres that provide limited food, snacks, sandwiches, and baked goods
- 3 - Centres that require carers to provide their own children's food.

Centre managers should consider and address the following key points:

- Procedures are in place to ensure that staff and parents thoroughly wash their hands before and during the preparation of any food.
- Procedures are in place to ensure that staff, parents and children who are suffering from an illness, which may be communicable, do not become involved in food handling activities
- Frozen food is thawed in the fridge, or using microwave ovens
- Raw food is stored so that it cannot contaminate cooked food or food that will not receive further cooking
- Steps are taken to ensure that the internal temperature of high risk food, for example processed meat and poultry (including livers) reaches at least 75°C during cooking (can be measured by a food grade thermometer)
- Readily perishable food is not stored for more than the cumulative two hours in the danger-zone (between 4°C and 60°C)
- Readily perishable food is cooled from 60°C to 21°C in two hours and from 21°C to 4°C in four hours (can be measured by a food grade thermometer)
- Cooked food is not stored in the refrigerator for more than two days
- Food is not re-heated more than once
- Re-freezing of food is avoided
- Cooked foods are stored above uncooked meats in the refrigerator
- Food is stored in covered containers
- Readily perishable foods pre-prepared at home and intended for on-site consumption are stored in the refrigerator prior to consumption
- All fresh fruit is washed in potable water prior to eating or preparation
- An allergen management plan is in place

- Have guidelines covering the handling and storage of expressed breast milk and powered formula is appropriate.

It is recommended that all staff members of an early childhood centre where food preparation takes place complete an accredited basic food hygiene or food safety course. Further information can be obtained from the Auckland city council (appendix 2).

Playdough is mentioned in Nga Kupu Oranga: Healthy Messages (appendix 5) as being a substance that should be treated as a food because no matter how it is made, some children will try and eat it. Since 1997 when this document was published there has been a *Salmonella* outbreak (2009) where raw flour (possibly playdough) was implicated. In light of this, ARPHS does not consider appropriate that playdough should be promoted as being “clean and safe for playing or eating”.

All early childhood centres without a registered Food Safety Programme are required to comply with Food Hygiene Regulations 1974 covering:

- general cleanliness of premises
- duties of occupiers
- maintenance of hand wash basins (for kitchen use)
- vermin control
- refrigeration and food storage
- conditions of appliances, packages and receptacles
- cleaning of places and equipment
- food protection
- protective clothing
- behaviours of workers.

3.4 Kitchen Facilities and Dishwashing

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF16

Early childhood centres kitchens must have adequate space and facilities (with adequate access to the refrigerator, dishwashing and cooking facilities). In addition for good hygiene should also have equipment which limits cross-contamination such coloured chopping boards for different food groups.

Food service articles need to be maintained in a hygienic and sanitary manner. Food service articles may be washed either by hand or in a suitable dishwasher. A commercial dishwasher is preferable, however domestic dishwashers are not generally suitable as the temperature of water used to wash and rinse may not be of a sufficiently high temperature to sanitise the dishes. Dishwashing must be carried out in accordance with the guidelines outlined below.

COMMERCIAL DISHWASHERS MUST HAVE:

- a minimum wash temperature of 60°C or higher
- a rinse that lasts for 10 seconds or longer with water at a temperature of at least 77°C
- a device that gives an automatic dose of soap or detergent
- baskets and trays that allow all dishes to get completely wet
- temperature control that stops the machine if the water temperature is too low, or the rinse temperature cannot continue for at least 10 seconds
- a thermometer to show the temperature of rinse water.

CENTRES THAT HAND WASH DISHES MUST:

- use water that is at least 43°C
- have adequate soap or detergent.
- Kitchen — hot water must be provided in the kitchen to enable utensil washing to comply with the Food Hygiene Regulations 1974. In the case of dishwashing machines this may require a higher temperature than 60°C, but in the case of hand dishwashing a temperature of not less than 43°C is required.

THE DISHES MUST THEN BE RINSED AND SANITISED.

- Dishes must be sanitised by either placing in clean boiling water for 30 seconds, or in clean water that is at least 77°C for 2 minutes.
- The dishes must be separated from each other while they are being sanitised (by means of a wire basket or other appliance).
- The dishes must be removed and immediately left to air dry (tea towels or cloths should not be used to dry or polish the dishes once they have been sanitised).

Commercial dishwashers should be a requirement wherever food is produced on site. In ECE services where only snacks are consumed and cutlery or plates are not provided, there is little potential for cross contamination and commercial dishwashers need not be a requirement. If the cost of a suitable dishwasher is prohibitive, early childhood centres should be advised to consider using disposable plates and cutlery.

3.5 Refuse Storage and Disposal

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF16

Poor refuse storage attracts vermin and increases the risk of disease transmission. Features to be considered include:

- refuse bins and soiled nappy bins must be well maintained, and emptied and cleaned at least daily
- all bins must have close fitting lids to exclude children and insects
- external refuse bins are to be emptied and cleaned at least weekly to minimise odours
- bins should be placed to prevent children, insects and scavenging animals gaining access.

3.6 Pest and Vermin Control

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF16

The centre should be free of pests and vermin at all times. Immediate action should be taken to control and eliminate any infestation of pests or vermin affecting the early childhood centre.

The centre should consider the following animals and insects as pests and consider how they would control an infestation (rodents, cockroaches, flies, birds, mosquitoes, ants, silverfish, fleas, mice, wasps and any other common pests of the locality).

4. Toilet/handwashing area

4.1 Toilet Hygiene

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF20 and PF21

Develop cleaning schedules to maintain good hygiene in the toilet area. The floor should have a surface that is easy to clean. The number of toilets is stipulated by *Building Codes G1 (table 1)* (appendix 7) and is approximately one toilet for every 15 people over the age of two years.

The centre should use policies and systems that ensure children and adults wash their hands after using the toilet, touching and handling animals, nappy changing, when visibly dirty and before and after eating.

5. Nappy change / body wash area

5.1 Nappy Changing

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF25 and HS3

The nappy changing area is one of the most likely sources of disease transmission and therefore strict hygiene controls should be in place. Managers should ensure that:

- The nappy changing surface is constructed of solid and stable material that has been designed to minimise the possibility of falls
- That it is located in a designated area near hand washing facilities and separate from play and food preparation areas
- The surface is smooth, easily cleaned, and waterproof
- A new nappy change surface (e.g. paper towel or disposable sheet) is used for each child, in addition to sanitising the washable surface
- A suitable sanitiser, such as 0.1% hypochlorite, is readily accessible and used after each nappy changing. (The sanitiser should be washed off with a water spray after use, as the sanitiser itself may cause irritation of sensitive skin. The sanitiser should be stored so that it is inaccessible to the children)¹ (Appendix 13).
- A cleaning/nappy changing procedure is clearly displayed above the table (this should list steps that must be taken to ensure good hygiene is maintained during and after changing nappies)
- A soiled nappy storage bin, with a sealable lid, is placed conveniently near the changing table but inaccessible to children
- Gloves must be worn by the person changing children to prevent the spread of infectious diseases
- The nappy change area has suitable hand washing facilities readily available to the changer
- It is recommended that reusable nappies are not laundered at the centre but are taken home with the child. They should be rinsed off first before being placed in a labeled heavy sealed plastic bag and stored in a bin with a close fitting lid (see above) for parents to collect at the end of the day to take home and wash.

Do not use fold-out nappy change tables covered with nylon, canvas or other non waterproof materials that can not be easily cleaned and sanitised in centres.

Examples of nappy changing facilities



5.2 Body Wash Facilities

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF26

Plumbed-in wash facilities are a requirement for all new early childhood centres to comply with the Building Act 2004 including the building code. Services that are renovating may also be required by territorial authorities to have plumbed-in wash facilities to meet the requirements of the building code. For advice, service providers should check directly with Auckland city council. Under G1.3.1 of the building code relating to personal hygiene there is a specific requirement for ECEs to have as a minimum a bath (see Table 2 page 27 of the Compliance Document for the NZ Building Code Clause G1 Personal Hygiene - Second Edition available on the following website - <http://www.dbh.govt.nz/UserFiles/File/Publications/Building/Compliance-documents/G1-personal-hygiene.pdf>)

¹ Hypochlorite solutions lose strength so prepare enough for each day or store unused dilutions in a cool dark place

All services need to ensure their hygiene and infection control procedures are practical, clear and comprehensive to manage risk of cross infection for their children and also their staff. Guidance as to how this can be achieved is available on the Ministry of Education's website www.lead.ece.govt.nz. Services can still (and should be encouraged) to install plumbed-in wash facilities.

It is recommended that, in circumstances where there are no plumbed in facilities, there should be a tub large enough and stable enough for children to be washed safely. However consideration should also be given to the need for the container to be emptied down an appropriate waste system, for example a toilet. Too much water would be heavy to pour down a wastewater system. Some form of hose type connection which provides a permanent supply of warm water would be preferable.

Procedures to ensure effective hygiene and infection control should include how the tub is to be emptied and cleaned after use. This procedure should be attached to a wall in appropriate and visible location. Alternatively an ECE may choose to install a shub in which case the following should be considered:

- The shub should be in easy reach of any nappy change table and approximately waist high to reduce the risk of back injury
- The shub should have a flexible hose and hot and cold water mixer. The hot water must be delivered no hotter than 40°C
- The surface of any shub should be smooth, easily cleaned, robust and waterproof
- The recommended interior size of any shub should as a minimum be at least 600mm wide x 600mm long x 300mm deep – or if only used by children under two years – 520mm wide x 520mm long x 300mm deep.

Procedures for effective hygiene and infection control include:

- use of disposable gloves
- use of a disposable cloth to clean the child
- safe disposal of wastewater
- cleaning of bucket/tub with clean water and an appropriate cleaning agent.

6. Child Health

6.1 Disease prevention and control

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF27 and HS26

Centre management should develop an exclusion policy for the centre and for the temporary isolation of at least one child. Centre managers should consider and develop policy on:

- Grounds for excluding children and staff from the centre
- Procedures and staff responsible in the management of any exclusion
- Management access to medical advice should that be required
- Management of children temporarily isolated at the centre
- Supervision arrangements for the isolated child
- Procedures in place to control outbreaks of parasites, fungal infections and communicable diseases
- The actions specified in appendix 2 of the licensing criteria for early childhood education and care centres 2008 is taken for any person (adult or child) suffering from particular infectious diseases; and
- Children who become unwell while attending the service are kept at a safe distance from other children (to minimise the spread of infection) and returned to the care of a parent or other person authorised to collect the child without delay. Procedures for informing staff and parents (or guardians) of the centre's exclusion policies.

These policies should be designed in conjunction with *Nga Kupu Oranga* (Ministry of Health, appendix General infectious disease information can be found at Appendix 8)

6.2 Immunisation

(a) Immunisation Register

Health (Immunisation) Regulations 1995 (Appendix 9)

Centre managers should have a register containing the immunisation status of all children attending the centre. The centre must ensure that a staff member views the immunisation certificate(s) of each child either when the child enrolls at the centre or when the child reaches 15 months of age. This register must be available for viewing at the request of ARPHS or the MinEdu.

(b) Staff Immunisation

Staff members at early childhood centres face an increased risk of exposure to childhood diseases, which can pose a more serious risk for adults. It is recommended that staff ensure that they have immunity to measles, mumps, rubella and chickenpox. It is recommended that all adults have a booster dose of adult tetanus-diphtheria vaccine every 10 years or after some injuries and an annual influenza vaccination. Adult whooping cough booster vaccination every 10 years is also recommended.

An up-to-date record of relevant health conditions such as allergies, food intolerances, and medical conditions should be kept.

For more information please refer to Appendices 6 and 10.

7. Sleep area

7.1 Sleeping Facilities and Bedding

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF29-PF30 and HS10-HS11

- Adequate space, service and facilities for undisturbed rest are required “*where children under 2 attend or where children over 2 attend for more than 4 hours*”.
- The Education (Early Childhood Centres) Regulations 2008 require all centres to have a system in place for monitoring sleeping children. Supervision of sleeping children is critical. If an adult is unable to be present in the sleep room then the sleep room must have a viewing window so an adult can observe sleeping children. The Ministry of Education requires physical checks on sleeping children at least every 5-10 minutes. The use of video cameras and/or monitors is not acceptable
- A separate room may not be required for sessional centres but a quiet and safe area must be provided for children to have undisturbed rest if required
- No child is to have access to any fluids or drinks while in bed or resting and designated officers will need to ensure that a policy is in place to reflect this
- Beds and cots should be laid out to ensure that children have easy access, spaced so that they do not disturb each other, and that there is sufficient room for adults to move freely around beds/cots. It is recommended that approximately 1.4m² be provided for large free standing costs. Beds and mattresses should be placed to avoid hazardous areas (walkways, opening doors or below heavy objects)
- Linen (sheets and blankets) are not to be communal and designated officers should ensure that each child needing to sleep has personal bed linen. If bed linen cannot be allocated to each child, it must be washed after each use.

ARPHS recommends the use of cots for infants under two years of age as it is difficult to sustain sufficiently warm temperatures at floor level for sleeping infants. Cots must be in good condition, and older style cots should be evaluated to ensure they meet current safety conditions and comply with the AS/NZS 2172:1995 Cot Safety Standards (appendix 10). A ratio of one cot per two children under two years of age is reasonable and the ratio of beds/mattresses to children over the age of two years is at the discretion of the service provider and in discussion with the Ministry of Education.

Padded cot-surrounds for the top-end of cots (bumper pads) are not considered suitable in an early childhood setting and all other possible causes of suffocation need to be eliminated. Latches on cots should be checked and a lead-based paint test may be required on older cots. No form of restraint, such as straps to hold children down in cots, is to be used on children to keep them in beds.

Multi-cots are only acceptable if the following can be assured:

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF29-PF30

- the area situated around each cot is well ventilated to allow sufficient fresh air, no build up of carbon dioxide, moisture and heat
- cots are built to New Zealand Standards [AS/NZS 2172:2003 *Cots for Household Use – Safety Requirements*]
- the cots must be secured to the wall so that the cots cannot fall in any event
- there is a specific evacuation plan for the sleep room where such cots exist
- New Zealand Fire Service has no concerns about the safety of the sleeping arrangements
- cots are easily accessible by staff and a sufficient distance apart to avoid cross infection. It is not possible to specify what an appropriate distance is, but as a minimum children should not share cots. Children are able to sit up in the cots. Children who are able to stand up are not to be placed in upper cots.

Managers must ensure that each child has personal bed linen. If bed linen cannot be allocated to each child, it must be washed after each use.

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF30

Mattresses must have a surface that is smooth, easily cleaned and waterproof. In general, nylon fabrics are not acceptable as they are not waterproof. The waterproof layer should cover at least the whole of the upper surface and all sides of the mattress. It is recommended that these waterproof covers are held in place with elastic or similar.

It is essential that plastic mattress covers are securely attached to mattresses, and preferably constructed of material at least 125 micron thickness plastic. It is recommended that these water proof covers are held in place with elastic or other such device. Any ripped plastic mattress covers must be replaced immediately.

8. Whole of Premises

8.1 General Cleaning

Licensing Criteria for Early Childhood Education and Care Centres 2008, PF6

The centre manager should ensure that adequate cleaning schedules are developed, even if an outside agency is used to clean the premises. The minimum areas that the schedules must specifically include are:

- kitchen
- laundry
- nappy changing area and surface
- toilet area

Licensing Criteria for Early Childhood Education and Care Centres 2008, HS1

0.5% hypochlorite should be used for general sanitation of bathroom, and toilet surfaces. At the end of each day this concentration should then be used on nappy change surfaces² (Appendix 13).

² Hypochlorite solutions lose strength so prepare enough for each day or store unused dilutions in a cool dark place

The micro-organisms least likely to be killed by bleach or any other disinfectant are Giardia and cryptosporidium. These organisms produce microscopic cysts about 1/100th millimetre in size or smaller, which can stick onto surfaces. The best way to deal with these organisms is to use a good detergent. This means that frequent cleaning with detergent is best for toys, tables, and other non-toilet surfaces rather than bleach.

8.2 Water Temperature

Licensing Criteria for Early Childhood Education and Care Centres 2008, HS13, HS14 and PF24

The water temperature of any plumbing fitting to which children have access must be at a delivery temperature not greater than 40°C.

- Sanitary - the hot water temperature of all sanitary appliances which can be accessed by children must be at a delivery temperature not greater than 40°C. A tempering valve is an acceptable mixing device to achieve this temperature
- Hot water cylinders - to prevent the growth of *Legionella* bacteria cylinders are to be set at not less than 60°C
- Kitchen - hot water must be provided in the kitchen to enable utensil washing to comply with the Food Hygiene Regulations 1974. In the case of dishwashing machines this may require a higher temperature than 60°C, but in the case of hand dishwashing a temperature of not less than 43°C is required.

“Dead legs” is a plumbing term referring to any piping, however short, that leads nowhere or is rarely used but can be filled with warm water and contamination such as biofilm and dirt that may encourage the growth of *Legionella* bacteria. Check that upgrades or changes have not led to such a dead leg.

8.3 Laundry Facilities

Licensing Criteria for Early Childhood Education and Care Centres 2008, HS2

Linen used by children or adults is hygienically laundered (HS2). This includes a requirement for the procedure for the hygienic laundering (off-site or on-site) of linen used by the children or adults. In developing a procedure service should consider the following reflective questions:

- How does the service wash and dry laundry?
- How is dirty linen stored? Is there a lidded nappy bin into which to put wet and soiled nappies?
- Are different types of laundry washed separately e.g. kitchen and bathroom linen separated from bedding linen for example?
- How are materials dried after washing?
- How often are different materials washed in the service? For example,
 - cleaning cloths;
 - clothing used in dress ups;
 - cloths used during nappy changes (e.g. after every use?);
 - cushion covers;
 - face cloths (e.g. after every use?);
 - kitchen tea towels (once a day?);
 - linen used during rest or sleep and;
 - soft toys.

A wide range of washing machines are likely to be found in centres. Centres should be advised that all washing must be done in hot water with an adequate amount of laundry detergent. Principal considerations are that:

- Every centre has adequate space and facilities for laundering.
- Centres catering for children **under** two years of age or choose to wash soiled nappies must have an adequate and suitable washing machine on the premises. A suitable washing machine set at 60°C will ensure nappies are clean. It is a good idea to have a door leading directly from the laundry to the

outside area so staff can access the washing line without walking through the centre should they not have a drier available.

- Because re-usable nappies generally require pre-soaking it is recommended that they are not laundered at the centre but taken home with the child (refer to section 9.4.1).
- Centres catering for children **over** two years of age are recommended to have a suitable washing machine located on the premises. However, it is acceptable for these centres to make other arrangements for general laundry, such as sending them to an off-site laundering facility e.g. commercial laundromat.

A suitable nappy sanitiser, such as two percent hypochlorite, should be readily accessible for nappy changing [refer section 9.4 above] but not accessible to children.

8.4 Sewage Disposal

Disposal through a reticulated system would not be considered a cause for comment unless there were obvious deficiencies.

Matters to be considered for centres having on-site wastewater system (septic tank or similar) that are essential for their long-term viability are:

- Disposal fields must be inaccessible to children
- Disposal fields must be functioning effectively with no surface ponding or break-out.

Management plans are recommended. These should include: provision for regular pump-out of sludge in the case of a septic tank; routine maintenance of package treatment plants in accordance with manufacturers' recommendations; and in accordance with design engineers' recommendations in the case of other installations. For further information refer to the Australian/New Zealand Standard 1547:2000 On-site domestic-wastewater management.

9. General Public Health Information

9.1 Lead Paint

Any buildings built prior to 1980 could have been painted in the past with lead-based paint. Lead in paint was greatly reduced in 1965, although some leaded paint was in use until 1980. When repainting surfaces that have been painted with lead-based paint you need to follow the *Guidelines for the Management of Lead-based Paint* (issued by OSH, Department of Labour and Ministry of Health). Contact ARPHS for further information.

Soil within 1.5 metres from exterior walls of old buildings may have been contaminated in the past by lead paint flakes or contaminated dust. This soil needs to be made inaccessible or unattractive to children (i.e. cover with decking or use as a flower garden).

Centre managers should ensure that paint on cots, toys and furniture is lead free. If testing is required, advice on actions to be taken will be provided to the centre after results have been received. For more information refer to appendix 11.

9.2 Asbestos

Material suspected of containing asbestos should be tested. Contact ARPHS for further details and public health advice. If asbestos is identified, the local Occupational Safety and Health Office at the Department of Labour (appendix 3) should also be contacted for further advice relating to exposure of staff. For more information about asbestos please refer to *Appendix 12*.

9.3 Sun Care

Exposure to potentially hazardous ultra-violet radiation is a growing health issue in New Zealand. Young children often have very sensitive skin and therefore have an increased risk of sunburn by ultra-violet rays. Centres should have a sun-safe policy which must specify:

- the hours and length of outside play
- the use of sun screens and shaded areas
- the children's personal protection from the sun, i.e. sunscreen, hats, sun-proof clothing etc.

Centres can obtain further information on the development of a sun-safe policy from the local Cancer Society, who in 2005 developed guidelines for schools seeking to design shade. These are available on the SunSmart website <http://www.sunsmart.org.nz/>.

9.4 Smokefree Policy

Education (Early Childhood Centres) Regulations 2008 R.46 (Appendix 1)

Early childhood services must ensure that they are smoke Free, including outdoor areas. Under the Smoke-free Environments Act 1990, all schools must have a written workplace smoke Free policy that applies to all staff as employees. Early childhood centres are encouraged to be totally smoke Free and a model policy is contained in *Nga Kupu Oranga* (appendix 5).

Appropriate signage is key to a successfully functioning smoke Free policy. Refer to the Ministry of Health's website for examples of appropriate signage as follows:

<https://www.healthed.govt.nz/health-topic/regulations-and-signage>

9.5 Health Education Resources

There are a wide range of health education resources that early childhood centres may find helpful. A copy of the current catalogue is provided to the public health units authorised provider. This catalogue may be copied to the centres, who can then order any resources directly, through the authorised provider. Designated officers may also find it useful to take with them spare copies of the catalogue and examples of resources for distribution during their visits.

Appendices

Appendix 1

Link to Education (Early Childhood Centres) Regulations 2008

<http://legislation.govt.nz/regulation/public/2008/0204/latest/DLM1412501.html>

Appendix 2
Contacts

Organisation	Office	Physical Address	Postal Address	Phone	Website
Auckland Regional Public Health Service	Central Office Cornwall Complex	Floor 2, Building 15 Greenlane Clinical Centre Auckland	Private Bag 92 605 Symonds Street Auckland 1150	09 623 4600	www.arphs.govt.nz
Ministry of Business, Innovation and Employment (MBIE)	Head Office (see website for Regional details)	Level 8, 33 Bowen Street, Wellington	PO Box 5488 Wellington 6011	04 901 1499	http://www.mbie.govt.nz/
Territorial Local Authority	Auckland City Council	35 Graham Street Auckland Central	Auckland Council Private Bag 92300 Auckland 1142	09 301 0101	www.aucklandcity.govt.nz
	Franklin District Council	82 Manukau Road Pukekohe		09 237 1300	
	Waitakere City Council	6 Waipareira Avenue Waitakere City		09 839 0400	
	North Shore City Council	1 the Strand Takapuna North Shore City		09 486 8600	
	Papakura District Council	35 Coles Crescent Papakura		09 295 1300	
	Manukau City Council	3 Osterley Way Manukau Manukau City		09 262 5104	

Organisation	Office	Physical Address	Postal Address	Phone	Website
	Rodney District Council	50 Centreway Road Orewa Auckland		0800 426 5169	
Ministry of Education	National Office	45-47 Pipitea Street Wellington	PO Box 1666 Thorndon Wellington	04 463 8000	www.minedu.govt.nz
	Auckland Regional Office	12-18 Normanby Road Mt Eden Auckland	Private Bag 92644 Symonds Street Auckland	09 632 9400	www.minedu.govt.n
EPA	Head Office	Level 10, 215 Lambton Quay Wellington 6011	Private Bag 63002, Wellington 6140 New Zealand	04 916 2426 0800 376 234 (HSNO Advisory)	www.epa.govt.nz

Appendix 3

Link to Building Act 2004

<http://dbh.govt.nz/bofficials-buiding-act-2004-overview>

Appendix 4

Link to Drinking Water Standards New Zealand 2005

<http://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2008-0>

Appendix 5

Link to *Nga Kupu Oranga* – Health and Safety Resource for Childcare Services; Ministry of Health 1997 [Nga Kupu Oranga HealthyMessages.pdf](#)

Appendix 6

Link to Food Hygiene Regulations 1974

http://www.legislation.govt.nz/regulation/public/1974/0169/latest/DLM42658.html?search=ts_regulation_Food+Hygiene&sr=1

Appendix 7

Link to New Zealand Building Code Compliance documents and handbook

<http://www.dbh.govt.nz/building-code-compliance-documents>

Appendix 8

Link to infectious diseases and similar resources

<https://www.healthed.govt.nz/resource/infectious-diseases>

Appendix 9

Link to immunisation resources

<http://www.health.govt.nz/our-work/preventative-health-wellness/immunisation>

Appendix 10

Link to Ministry of Consumer Affairs website; AS/NZ 2172:1995 Cot Product Safety Standard

<http://www.consumeraffairs.govt.nz/legislation-policy/acts-regulation/product-safety-standards/mandatory-standards/household-cots>

Appendix 11

Link to lead and lead paint resource

<https://www.healthed.govt.nz/resource/lead-and-lead-poisoning>

Appendix 12

Link to asbestos resources

<https://www.healthed.govt.nz/resource/all-about-asbestos>

<https://www.healthed.govt.nz/resource/removing-asbestos-home>

Appendix 13

Recommendations for Cleaning and Disinfecting in Early Childhood Education Centres

A high level of hygiene should be maintained throughout the centre at all times to prevent the spread of communicable diseases.

Why we recommend "Bleach" as a Disinfectant

Recently there have been outbreaks in early childhood education centres of diseases caused by micro-organisms (germs) such as Giardia and Cryptosporidium (protozoa), salmonella (bacteria) and Norwalk-like viruses (a virus). Because many of these micro-organisms (especially protozoal cysts and viruses) are resistant to most disinfectants, we recommend that **only disinfectants containing the chemical hypochlorite are used or stored on the premises.**

Hypochlorite has long been recognised as having outstanding disinfection properties, and is widely available, cheap, and widely used in homes, schools, hospitals, swimming pools and in drinking water supplies.

Hypochlorite is available under many brand names including:

- "No Frills Bleach", "Janola", "Brite Bleach", "White Magic", "Hypersol", "Exit Mould", "Hypersol"

And some toilet cleaners, including:

- "Harpic Plus Bleach Liquid Toilet Cleaner", "Janola Bleach Powder Toilet Gel"

Bleach is unpleasant to work with, and centres are often keen to find alternatives. If you wish to use an alternative disinfectant, you must have scientific evidence (from your supplier) of the effectiveness of the disinfectant against a very wide range of micro-organisms including bacteria, viruses and protozoal cysts. (Beware of misleading sales tactics such as the phrase "used in hospitals"- nappies are not changed in all areas of a hospital!).

Hypochlorite strengthens:

- **0.1%** hypochlorite should be accessible and used after each nappy changing. (The sanitiser should be washed off with a water spray after use, as the sanitiser itself may cause irritation of sensitive skin. The sanitiser should be stored so that it is inaccessible to the children).
- **0.5%** hypochlorite should be used for general sanitation of bathroom, and toilet surfaces. At the end of each day this concentration should then be used on nappy change surfaces.

Cleaning Schedules

Cleaning schedules are a means of ensuring cleaning and disinfecting is done as often as necessary. They should be developed for the centre, even if an outside cleaning agency is used to clean the premises. The areas that the schedules must specifically include are:

- *kitchen*
- *laundry*
- *nappy changing area and surface*
- *toilet areas*
- *toys and play equipment.*

A good cleaning schedule clearly identifies:

- *a responsible person (who initials when tasks are completed)*
- *utensils / equipment / areas that should be cleaned*

- a method of cleaning, including cleaning and disinfecting agents
- frequency of cleaning

A suggested template for a cleaning schedule is attached.

Recommended Minimum Frequency of Cleaning and Disinfecting

- Nappy-changing areas should be cleaned and disinfected **after every nappy change**.
- If a child has a faecal accident (poos their pants), clean the child in the shub, change their clothes, and clean and disinfect any soiled surfaces **immediately**.
- Toys, floors, sinks, toilets and other hard surfaces should be cleaned and disinfected **at least daily**.
- Food preparation areas should be kept clean and disinfected to avoid cross-contamination- all staff handling food should have **food safety training**.
- Linen should be laundered **between use by different children**, and/or when soiled, and at least weekly. Dry on the washing line if you can, as the sunlight kills germs. (If this is not possible, use a tumble-drier). Each child's bedclothes, clothes and belongings should be kept separate.
- Soft toys, dressing up clothes and soft furnishings should be laundered regularly or whenever soiled.
- Outdoor play equipment should be cleaned and disinfected regularly. Some artificial grass surfaces can be disinfected with hypochlorite bleach- check with your supplier.

Cleaning

- Clean first before disinfecting, to allow disinfectants to work. Soaps, detergents, scourers (e.g. "Jif", "Ajax", "Spray'n'Wipe") and hot water help with cleaning, but do not disinfect. Scrubbing is also ineffective.

Disinfecting general areas

- Household bleaches (e.g. "Janola", "White Magic" etc.) are sold in different strengths (usually 2%-5% hypochlorite) that are written on the label.
- Dilute the bleach with water to make a **0.5% hypochlorite** solution (see instructions attached).
- **Saturate** the area to be disinfected with the hypochlorite solution.
- **Leave** the solution on the area **for as long as possible**, preferably 30 minutes.
- **Wash off** the solution thoroughly with copious amounts of water, so that children and staff are not exposed to residual bleach solution. (Use a hose if outside).
- If a toilet cleaner is used, use a product that contains at least 0.5% hypochlorite.

Safety Tips

- **Never** mix chemicals as toxic gases can be produced.
- Be aware- bleach irritates the nose, lungs and skin, and some people are particularly sensitive.
- Wear gloves, particularly if handling undiluted bleach.
- Store disinfectants and diluted disinfectants safely and label them properly.

Outbreaks

- You can reduce the likelihood of experiencing outbreaks of disease at the centre by following cleaning schedules, excluding children who are unwell, encouraging hand-washing and hand-drying and other infection control practices. However, sometimes outbreaks may occur despite following good practice.
- During and following an outbreak of a communicable disease, we may ask you to increase the frequency of cleaning or disinfecting, or the strength or type of disinfectant used.

Disinfecting Sand and Sandpits

- ESR has advised that there is no effective means of disinfecting sand. (Methods that use household bleach or salt are ineffective).
- To protect the health of children, all sand that is contaminated, or suspected to be contaminated, must be discarded using your usual refuse disposal procedures.
- Sandpits should be protected with a tight-fitting cover, and the sandpit must be raked at least daily (and preferably before and after each use) to ensure hazards (such as glass, animal droppings) can be removed.
- The Ministry of Education may provide more detailed advice about design, construction and maintenance of sandpits.

For more information, please contact the Early Childhood Education Centre Coordinator, Auckland Regional Public Health Service, ph (09) 623 4600.

Making a 0.1% and 0.5% hypochlorite solution

By using bleach containing different concentrations of hypochlorite

Follow the above instructions, but alter the quantities of bleach and water according to the following table:

For making **0.1%** hypochlorite:

Strength of bleach		Quantity of bleach	Quantity of water	Total volume of diluted solution
% hypochlorite	g/100ml hypochlorite			
0.5% ³	0.5 g/100ml	50ml	450ml	500ml
2 %	2 g/100ml	25 ml	475 ml	500 ml
3 %	3 g/100ml	10 ml	290 ml	300 ml
4 %	4 g/100ml	10 ml	390 ml	400 ml
5 %	5 g/100ml	10 ml	490 ml	500 ml

For making **0.5%** hypochlorite:

Strength of bleach		Quantity of bleach	Quantity of water	Total volume of diluted solution
% hypochlorite	g/100ml hypochlorite			
0.5%	0.5 g/100ml	Use undiluted	Nil	Use undiluted
2 %	2 g/100ml	100 ml	300 ml	400 ml
3 %	3 g/100ml	50 ml	250 ml	300 ml
4 %	4 g/100ml	50 ml	350 ml	400 ml
5 %	5 g/100ml	50 ml	450 ml	500 ml

To increase the amount of solution made

Double (or triple) the amount of bleach **and** water added.

Caution:

Hypochlorite solutions lose strength so prepare enough for each day or store unused dilutions in a cool dark place.

³ Recently 0.5% hypochlorite solution has become available for use undiluted (straight from the bottle). Check for a manufacturer's assurance that the concentration will not vary significant or reduce over time to less than 0.5%.

