For the use only of Registered Medical Practitioner

1. **Generic Name & Brand Name:**
   Povidone-Iodine Gargle 2 % w/v
   Nicodin® Gargle

2. **Qualitative and Quantitative Composition:**
   Composition:
   Povidone-Iodine I.P…2% w/v
   (available Iodine 0.2% w/v)
   Ethanol (95%) I.P.
   Equivalent to Absolute Alcohol 8.38 % v/v
   In a mint flavour aq. base

3. **Dosage Form & strength**
   Refer section 1 & 2

4. **Clinical particulars**

4.1 Therapeutic indication

It is used for the treatment of acute infections of the lining of the mouth and throat, for example, inflammation of the gums (gingivitis) and mouth ulcers. For cleansing the mouth (oral hygiene) before, during and after dental and mouth surgery.

4.2 Posology and method of administration

Mouthwash/rinse: Squeeze the bottle to fill required dose (as per dentist recommendation) of Mouthwash in dispensing neck. Rinse or gargle 5 mL or 10mL undiluted solution with an equal volume of warm water for 30 seconds 4 times daily for up to 14 days.

Method of Administration:

- Dilute with equal amount of water.
- Gargle or rinse for at least 30 seconds.
- Repeat up-to four times daily, for 14 days in a row. Or as directed. Do not use for more than 14 days.

4.3 Contraindications

Hypersensitivity to iodine, polyvinylpyrrolidone or to any excipient. History of abnormal thyroid function or goitre (in particular nodular colloid goitre, endemic goitre and Hashimoto's thyroiditis). Use in children under six years of age. Regular use should be avoided in patients on concurrent lithium therapy.

4.4 Special warnings and precautions for use

Use of this preparation may interfere with tests of thyroid function. Regular use must be avoided as prolonged use may lead to the absorption of a significant amount of iodine particularly in patients with renal insufficiency. Do not use for more than 14 days. If symptoms occur suggesting

changes in thyroid function, these should be investigated. In patients with impaired renal function, blood levels of iodine should be monitored. If local irritation and hypersensitivity develop, then discontinue treatment.
Povidone Iodine Gargle 2 % w/v can permanently discolour white gold jewellery and it is recommended that this type of jewellery should be removed before using Betadine Gargle and Mouthwash.

4.5 Drug Interactions:
Use with concurrent lithium therapy has been shown to exhibit additive hypothyroidic effects. Absorption of iodine from povidone iodine through either intact skin or broken skin may interfere with thyroid function tests. Contamination with povidone iodine of several types of tests for the detection of occult blood in faeces or blood in urine may produce false-positive results.

4.6 Use in special populations (Pregnancy, Nursing woman, Pediatric use, Geriatric use)
Iodine freely crosses the placenta and is secreted in breast milk. Thyroid function disorders have been reported in the offspring of mothers exposed to pharmacological doses of iodine. The use of Betadine Gargle and mouthwash in pregnant and lactating women should be limited to a single treatment session only.

4.7 Effects on ability to drive and use machines.
No data available

4.8 Undesirable effects
Idiosyncratic mucosal irritation and hypersensitivity reactions may occur. Anaphylactic reactions, anaphylactoid reactions and anaphylactic shock have been reported uncommonly with products containing povidone-iodine or povidone.
Excess iodine can produce goitre and hypothyroidism or hyperthyroidism. Such effects have occasionally been seen with extensive or prolonged use of povidone iodine. Other effects that have been reported are metabolic acidosis and acute renal failure

4.9 Overdose
Deliberate or accidental ingestion of large quantities of povidone iodine will result in high blood concentrations of iodine and gastrointestinal corrosive effects including vomiting, diarrhoea and abdominal pain. Systemic toxicity may result in shock, hypotension, tachycardia, fever, metabolic acidosis and renal impairment. Symptomatic and supportive treatment should be started with special attention to monitoring electrolyte balance, renal function, thyroid function and liver function. Haemodialysis effectively clears iodine and should be employed in severe cases of iodine poisoning particularly if renal failure is present. Continuous venovenous haemodiafiltration is less effective than haemodialysis.

5. Pharmacological properties
5.1 Mechanism of action
Povidone-iodine is called iodophore which means povidone acts as a carrier of iodine. Iodine is considered as the active moiety that mediates microbicidal actions. When released from the

complex, free iodine (I2) penetrates the cell wall of microorganisms quickly, and the lethal effects are believed to result from disruption of protein and nucleic acid structure and synthesis. While the full mechanism of action is not fully elucidated, iodine is thought to inhibit vital bacterial cellular mechanisms and structures, and oxidizes nucleotides fatty or amino acids in bacterial cell membranes. Additionally, free iodine disrupts the function of the cytosolic enzymes involved in the respiratory chain, causing them to become denatured and deactivated. In vitro evidence suggests that iodine also counteracts inflammation elicited by both pathogens and the host response via multifactorial effects. In hosts, povidone-iodine was demonstrated to modulate the redox potential, inhibit the release of inflammatory mediators such as TNF-α and β-galactosidase, inhibit metalloproteinase production, and potentiate the healing signals from pro-inflammatory cytokines by activation of monocytes, T-lymphocytes, and macrophages.

5.2 Pharmacodynamic Properties

Povidone Iodine Gargle 2 % w/v contains povidone-iodine, a complex of iodine which shows all the broad-spectrum germicidal activity is maintained in the presence of blood, pus, serum and necrotic tissue. Betadine Gargle & Mouthwash kills bacteria, viruses, fungi, spores and protozoa.

5.3 Pharmacokinetic properties

The product is intended for topical application to the mouth and buccal cavity.

6. Nonclinical properties

6.1 Animal Toxicology or Pharmacology

Acute Toxicity of Povidone-Iodine

Povidone-iodine has been found to exhibit significantly lower oral toxicity then do most organic iodine compounds. The intraperitoneal toxicity is higher than the oral effect.

LD50 rat (oral): 5990 mg/kg
LD50 mouse (i.p.): 360 mgkg

Chronic Oral Toxicity of Povidone-Iodine

Two experimental dogs received daily doses of 1.84 g povidone-iodine in enteric coated tablets over a 5-month period. The daily dose corresponded to 370 mg total or 280 mg available iodine. At the end of the study, the sacrificed test animals showed no gross pathology, and their histology was normal.

Cell Toxicity of Povidone-Iodine

One hour incubation of rat hearts in povidone-iodine (containing 0.5 to 5.0% available iodine) produced a cell toxicity that was evidenced by lower growth potential of the subsequently planted cells. The healing of skin wounds, on the other hand, was not affected by painting with these solutions as long as the level of available iodine was less than 2%. Concentrations of the latter as high as 5% slowed the healing of the wound without having a permanent effect.

Mutagenicity and Teratogenicity of Povidone-Iodine

The potential mutagenicity of povidone-iodine was thoroughly investigated using the intraperitoneally administered dominant lethal test, the micronucleus test, the bone marrow test, and animal experiments. In all these tests, with high doses of povidone-iodine, no mutagenic effect could be detected.

Various concentrations (16, 35, and 75 mg/kg/day) of a 15% aqueous povidone-iodine solution were injected intramuscularly to pregnant rabbits for 12 days during the 6-18 days of gestation. The only differences found between the test animals and the controls were some lower weight increases, and lower average weights of fetus and placenta. No toxic or teratogenic effect of povidone-iodine were noticed.

Reference: Eugene S. Barabas, Harry G. Brittain, Povidone - Iodine, Editor(s): Harry G. Brittain, Analytical Profiles of Drug Substances and Excipients, Academic Press, Volume 25, 1998, Pages 341-462

7. Description

Nicodin Gargle is supplied for oral gargle use. It should not be swallowed.
Nicodin Gargle contains Povidone-Iodine 2% w/v (available iodine 0.2% w/v) and Ethanol (95%) I.P. Equivalent to Absolute Alcohol 8.38% v/v.

8. Pharmaceutical particulars

8.1 Incompatibilities

Povidone iodine solution is influenced by several chemical and environmental factors as mentioned below

1. Povidone iodine is a complex formed by iodine and polyvinylpyrrolidone (PVP). Iodine is a halogen with a tendency to react with other compounds, including oxygen. This reaction can lead to the degradation of iodine over time.

2. Temperature affects the rate of chemical reactions. At higher temperatures, the rate of degradation reactions may increase, leading to a more rapid decline in the concentration of iodine and PVP in the solution. The degradation reactions can reduce the concentration of active iodine molecules in the solution, thereby lowering the assay value.

3. Iodine is known to be volatile, meaning it can evaporate readily at elevated temperatures. This volatility can lead to a decrease in the concentration of iodine in the solution over time, resulting in a lower assay value.

8.2 Shelf Life

Refer Pack

8.3 Packaging Information

Refer Pack

8.4 Storage condition & handling instructions
Refer Pack

9. Patient Counseling Information
Patient counseling is defined as providing medication information orally or in written form to the patients or their representatives on directions of use, advice on side effects, precautions, storage, diet and life style modifications (please refer designated sections).

10. Details of manufacturer
Refer Pack for manufacturer details.

Marketed by:
Abbott Healthcare Pvt. Ltd.
Angel Space, Bldg. D-4, Gala No. 1 to 6 &
11 to 16 Ground Floor, 101 to 106 &
111 to 116 First Floor, 201 to 206 & 211 to 216
2nd Floor, Pimplas, Dist. Thane, Bhiwandi - 421 302, India.
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12. Date of revision
Version 1.0, dated 09/09/2024

For Product Complaints/Adverse events or Queries please write to
webmasterindia@abbott.com