Contents

1. Introduction 1

2. Historical Overview 3
First Use of Refrigerants 4
Liquid Air and Liquid Oxygen 4
Carbonic Acid Snow 4
Liquid Nitrogen 5

3. Cryopathophysiological Considerations 7
Cryobiology 7
Cryomechanism 7
Cryohistology 9
Cryoimmunology 10

4. Principles of Cryosurgery 11

5. Cryosurgery Considerations in Otorhinolaryngology 12
Instruments 12
Cryosurgery Indications 14
Technique and Procedure 16

6. Clinical Applications in Otorhinolaryngology 20
Cryofreezing in Otology 20
Keloids and Hypertrophic Scars 20
Basal Cell and Squamous Cell Carcinoma of Ear and Face 20
Basal Cell Carcinoma of Ear 21
Photo Gallery of Otology 21
Cryosurgery in Oropharynx 25
Photo Gallery of Oral Cavity and Oropharynx 29
Cryosurgery in Nose and Nasopharynx 35
Epistaxis 35
Anterior Nasal Bleed 35
Posterior Nasal Bleed 36
Hemorrhagic Telangiectasia 36
Nasopharyngeal Angiofibroma and Carcinoma 37
Nasal-Polyposis 37
Chronic Allergic Rhinitis 37
Hypertrophic Rhinitis 38
Chronic Vasomotor Rhinitis 38
Photo Gallery of Nasal Lesions 39
Cryofreezing in Laryngopharynx 43
Juvenile Papilloma of the Larynx 43

Supraglottic Cavernous Hemangioma 43
Hypopharynx and Cervical Esophagus 44
Carcinoma in situ and Malignant Conditions 44
Photo Gallery of Laryngeal Lesions 45
Special but Rare Procedures 48
Hypophysectomy 48
Meniere's Disease 48
Glomus Jugularae Tumors 49
Cryosurgery—Postoperative Care 49

7. Cryosurgery—Results **50**
Photo Gallery—Cryosurgery Results 52
Justification 58

8. Cryosurgery—Conclusion **59**

Bibliography *61*
Index *65*