Thames Valley
Family Health Team

Medical Directive

Spirometry Testing with Bronchodilator and Treatment Initiation	**Assigned Number: 023**
Activation Date: April 24, 2013	**Review due by: December 2026**

Approval Signature & Date

Medical Director: _____ Date: April 17, 2025

Clinical Services Director: _____ Date: April 17, 2025

Order and/or Delegated Procedure:	**Appendix Attached:** ☐ **Yes** ☒ **No**

Spirometry testing with an Inhaled B2 Agonist Medication, initiation of treatment, and release of referral/requisition for further testing when indicated, in patients 6 years of age and older.

Recipient Patients:	**Appendix Attached:** ☐ **Yes** ☒ **No**

All active patients (attached or unattached) served by Thames Valley Family Health Team affiliated physicians and nurse practitioners, as identified on the Authorizer Approval Form.

Authorized Implementers:	**Appendix Attached:** ☐ **Yes** ☒ **No**

Thames Valley Family Health Team Registered Respiratory Therapists (RRT)*

The implementer must complete educational requirements for this medical directive, including review of the education package and medical directive and successful completion of any quizzes. If additional orientation or shadowing is needed, the implementer must make arrangements for this with their clinical supervisor. Once all of the above has been completed, they are required to sign the Implementer Performance Readiness Form electronically, via Citation Canada, indicating they have the knowledge, skill and judgment to safely enact the medical directive.

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Indications:	**Appendix Attached:** ☐ **Yes** ☒ **No**

- Detect the presence or absence of lung disease
- Quantify the severity of a known disease
- Screening for high-risk occupations
- Screening for early detection of COPD
- Assess response to therapeutic interventions

Contraindications:

- Allergy or hypersensitivity to B2 agonist medication
- Tachyarrhythmia
- Any contraindication to spirometry (Standardization of Spirometry 2019)

Consent:	**Appendix Attached:** ☐ **Yes** ☒ **No**

Informed verbal consent is obtained from the patient/substitute decision maker, per TVFHT: Informed Consent of Patient Healthcare Procedure, prior to the implementation of care.

Guidelines for Implementing the Order/Procedure:	**Appendix Attached:** ☒ **Yes** ☐ **No** Appendix 1: Patient Instructions for Spirometry Testing Appendix 2: Further Testing Appendix 3: Initiating Treatment for Asthma Appendix 4: Initiating Treatment for COPD

1. The patient is provided the Patient Instructions for Spirometry Testing (Appendix 1) by referring physician or nurse practitioner, or administrative staff at time of booking spirometry appointment, either eletronically or by mail.
2. Assess for allergies or hypersensitivity to medications and comorbidities that may be contraindications to administration of bronchodilator and potential treatments
3. The patient performs three acceptable spirometry tests per ATS standards.
4. The bronchodilator is administered via metered dose inhalation using a disposable spacer device where appropriate:

Ages 6-11 yrs: Salbutamol 100 mcg/puff – 2 puffs
Ages ≥12yrs: Salbutamol 100 mcg/puff – 4 puffs **OR** Terbutaline 500 mcg/inhalation – 2 inhalations
*A lower dose can be used if there is concern about any effect on the patient's heart rate or tremor.

5. Three additional acceptable spirometry tests are recorded 10 to 15 minutes later.
6. If the patient is already using inhalers prior to the spirometry/RRT visit, the RRT assesses both inhaler compliance and the extent of symptom relief the patient experiences from the inhalers.
7. Determine need for further testing as per Appendix 2 and release appropriate referral/requisition when indicated.

8. If the patient requires treatment with medication(s) and prior to prescribing:
   - Inquire about the patient's allergies to previously used medications and ensure that any undocumented allergies are recorded in the EMR
   - Ensure the patient is not allergic to the medication
   - Ensure patient does not have any comorbidities that may be contraindications
9. Provide prescription for appropriate medication, per Appendix 3: Initiating Treatment for Asthma and/or Appendix 4: Initiating Treatment for COPD
10. When possible, depending on availability, dispense sample of prescribed medication(s) to patient following CRTO guidelines for dispensing medication: https://www.crto.on.ca/pdf/PPG/Dispensing.pdf
11. Provide patient education regarding optimization of lung health, inhaler technique, adherence, and self-management.
12. Plan for appropriate follow up—RRT/physician/nurse practitioner.
13. Communicate findings, treatment initiation, and any referrals made to physician or nurse practitioner.

Documentation and Communication:	**Appendix Attached:** ☐ **Yes** ☒ **No**

- The implementer will follow the documentation standards set by their governing college.
- In the patient's medical record, documentation must be completed on the TVFHT documentation template provided for this directive.
- Information regarding implementation of the directive and the patient's response will be documented in the patient's medical record, in accordance with standard documentation practice.
- Requisitions and prescriptions release must include the directive name and number, authorizer's name, and implementer's name and signature—*except* when testing is needed at a hospital-based pulmonary function lab. In these cases, the RRT will release the requisition on behalf of the physician/NP using only the authorizer's e-signature, to align with the Public Hospitals Act and College guidance.

Review and Quality Monitoring Guidelines:	**Appendix Attached:** ☐ **Yes** ☒ **No**

The directive remains in effect until amended. It will be reviewed biennially or under the following circumstances:

1. The Medical Director identifies a need for change
2. Issues arise related to the directive's use--the team must promptly communicate concerns to their clinical supervisor, Medical Directives Coordinator, or Clinical Director
3. New information becomes available between scheduled reviews, particularly if it affects outcomes

The Medical Directives Committee will then review the concerns in consultation with at least one implementer and the Medical Director, as needed, before making necessary changes.

Approving Authorizer(s):	**Appendix Attached:** ☐ **Yes** ☒ **No**

TVFHT Authorizer Approval Form signed in Citation Canada.

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Appendix 1: Patient Instructions for Spirometry Testing

This instruction sheet will be provided to the patient at the time of referral or booking:

Patient Instructions for Spirometry Testing

Please withhold the following medications for the length of time indicated prior to your appointment.

0 hours	6 hours	12 hours	24 hours	48 hours
• Accolate	• Airomir	• Atrovent	• Advair	• Atectura
• Alvesco	• Bricanyl	• Combivent	• Foradil	• Anoro
• Arnuity	• Salbutamol		• Formoterol	• Breo
• Asmanex	• Salvent		• Oxeze	• Breztri
• Flovent	• Terbutaline		• Salmeterol	• Duaklir
• Montelukast	• Tornalate		• Serevent	• Enerzair
• Pulmicort	• Ventolin		• Symbicort	• Incruse
• QVAR			• Wixela	• Inspiolto
• Singulair			• Zenhale	• Onbreze
• Zafirlukast				• Seebri
				• Spiriva
				• Tiotropium
				• Trelegy
				• Tudorza
				• Ultibro

*If needed for symptom relief, a rescue inhaler (Ventolin, Symbicort) should be used. Please note the time of use and inform the Respiratory Therapist conducting the test.

Please avoid the following prior to testing:

30 minutes prior—Performing vigorous exercise
1 hour prior—Smoking
2 hours prior—Eating a large meal
4 hours prior—Consuming caffein or alcohol

On the day of your appointment:

Bring all your respiratory medications, including any handheld spacer devices, such as an AeroChamber.

Appendix 2: Further Testing

Full Screen Pulmonary Function Tests (with or without post-bronchodilator)

The implementer may release a referral/requisition for further testing to a Pulmonary Function Lab after performing pre- and post- bronchodilator spirometry in the following situations:

1. The patient's symptoms are suggestive of underlying lung disease, but results of spirometry testing are incongruent;
2. Spirometry testing indicates a combination of obstructive and restrictive disease, making interpretation more difficult;
3. Spirometry testing indicates moderate to severe restrictive disease not responsive to bronchodilator therapy.

Triaging to a Pulmonary Function Lab (with or without post-bronchodilator)

The implementer may release a referral/requisition for spirometry and/or pulmonary function testing to a Pulmonary Function Lab in the following situations:

1. Spirometry is not being performed in an office setting during the time of the referral.
2. The Implementer will determine if a patient requires further diagnostic testing at a Pulmonary Function Lab based on patient assessment, and access times.

* Note: When testing is needed at a hospital-based Pulmonary Function Lab, the RRT will release the requisition on behalf of the physician/NP using only the authorizer's e-signature, to align with the Public Hospitals Act and College guidance.

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Appendix: 3 Initiating Treatment for Asthma

Order Treatment Table for New and Established Cases of Asthma Adapted from GINA 2024 Strategy Report, accessed February 2025
Children Ages 6-11 Years
Symptoms of asthma < twice a month
Treatment: • As needed (PRN) low-dose ICS **and** SABA—taken together
Symptoms of asthma ≥ twice a month, less than daily
Treatment: • Daily low-dose ICS • Consider PRN SABA
Symptoms of asthma most days or wakes with asthma ≥ once/week
Treatment: • Daily low dose ICS-LABA **and** PRN SABA **OR** Daily medium dose ICS **and** PRN SABA **OR** Daily very low dose ICS-formoterol as both maintenance and PRN reliever
Symptoms of asthma most days or waking with asthma once per week and low lung function
Treatment: • Daily medium dose ICS-LABA **and** PRN SABA • Recommend referral for expert advice
Adults and Adolescents 12 Years and Older
Symptoms of asthma < 4 or 5 days/week
Treatment: • PRN ICS-formoterol
Symptoms of asthma most days OR wakes with asthma ≥ once/week OR low lung function
Treatment: • Daily low dose ICS-formoterol as maintenance and reliever therapy (MART)
Daily symptoms or waking with asthma more than once per week and low lung function
Treatment: • Medium dose ICS-formoterol as maintenance and reliever therapy (MART)
Daily symptoms or waking with asthma once per week or more and low lung function
Treatment: • If medium dose ICS-formoterol ineffective, ADD LAMA • Consider high dose ICS-formoterol

Per Order Treatment Table for New and Established Cases of Asthma above—provide prescription for 1 inhaler with 1 repeat	
***Note When adjusting to Yellow Zone medications follow the Lung Health Foundation's Adjustment of Inhaled Controller Therapy of Asthma in the Yellow Zone (2017), accessed February 2025*	
SABA (Short-Acting Beta Agonist)	
Contraindications • Hypersensitivity to medication or any component of the formulation • Tachyarrhythmia	
Salbutamol (Ventolin® pMDI 100mcg)	1-2 puffs every 4 hours as needed, up to 8 puffs per day
Terbutaline (Bricanyl® Turbuhaler 0.5mg)	1 inhalation every 4 to 6 hours as needed, up to 6 inhalations per day
ICS (Inhaled Corticosteroid)	
Contraindications • Allergy or hypersensitivity to medication or any component of the formulation • Status asthmaticus • Close monitoring is warranted in patients with a change in vision or with a history of increased intraocular pressure, glaucoma, and/or cataracts	
Ciclesonide (Alvesco® pMDI 100, 200 mcg) >6 years	Age: 6-11yrs 100-200mcg DAILY or divided BID Age: ≥12 yrs 100-400mcg DAILY up to 400mcg BID (Max dose 800mcg/day)
Fluticasone Furoate (Arnuity® Ellipta 100, 200 mcg) ≥ 12 years	Age: ≥12 yrs 100-200mcg 1 puff DAILY (Max dose 200mcg/day)
Fluticasone Propionate (Flovent® HFA pMDI 50, 125, 250 mcg) ≥ 1 year	Age: 6-11 yrs 50-200 mcg BID or 125 mcg daily Age: ≥12 yrs 125 mcg daily or BID or 250 mcg BID (Max dose 2000mcg/day)
Beclomethasone dipropionate (QVAR® pMDI 50,100 mcg) >5 years old	Age: 6-11yrs 50-200mcg BID Age: ≥12yrs 50-400mcg BID (Max dose 800mcg/day)
Fluticasone propionate (Flovent® Diskus 100, 250, 500 mcg) ≥ 4 years	Age: 6-11 yrs 100 mcg 1-2 puffs BID Age: ≥12 yrs 100-250 mcg 1-2 puffs BID (Max dose 2000mcg/day)
Budesonide (Pulmicort® Turbuhaler 100, 200, 400 mcg) ≥ 6 years	Age: 6-11yrs 100-400mcg BID Age: ≥12 yrs 200-400 mcg BID (Max dose 2400mcg/day)
Momethasone fuorate (Asmanex® Twisthaler 100, 200 mcg) >4 years old	Age: 6-11yrs 100mcg DAILY to BID Age: ≥12 200-400 mcg DAILY, or up to 200mcg BID (Max dose 800mcg/day)

ICS/LABA **(Inhaled Corticosteroid/Long-Acting Beta Agonist)**	
Contraindications • Severe hypersensitivity to milk proteins (Advair Diskus and other DPIs) • Close monitoring is warranted in patients with a change in vision or with a history of increased intraocular pressure, glaucoma, and/or cataracts • Tachyarrhythmia • Status asthmaticus	
Budesonide + Formoterol (Symbicort® Turbuhaler 100/6, 200/6 mcg) ≥12 years old	100-200mcg 1-2 puffs BID or 2 puffs DAILY (Max dose 1600mcg/day) *200/6 mcg strength can be used PRN in addition to maintenance dosing up to 8 inhalations per day per SMART dosing
Mometasone + Formoterol (Zenhale® pMDI 100/5, 200mcg/5 mcg) ≥12 years old	100-200 mcg 2 puffs BID (Max dose 800mcg/day)
Fluticasone furoate + Vilanterol (Breo® Ellipta 100/25, 200/25 mcg) ≥12 years old	100-200 mcg 1 puff DAILY (Max dose 200mcg/day)
Fluticasone propionate + Salmeterol (Advair® Diskus/ Wixela® Inhub 100/50, 250/50, 500/50 mcg) ≥4 years old	Age: 4-11yrs 100 mcg 1 puff BID Age: ≥12yrs 100-500 mcg 1 puff BID (Fluticasone max 2000mcg/day) (Salmeterol max dose 100mcg/day—increase dose of inhaler rather than number of puffs if escalating dose of Diskus)
Fluticasone propionate + Salmeterol (Advair® MDI 125/25, 250/25 mcg) ≥12 years old	Age: 4-11 yrs 125 mcg 1 puff BID Age: ≥12yrs 125-250mcg 2 puffs BID (Fluticasone Max dose 2000 mcg/d) (Salmeterol Max dose 100 mcg/d)
LAMA **(Long-Acting Muscarinic Antagonist)**	
Contraindications • Glaucoma • Prostatic hyperplasia or bladder neck obstruction (Tiotropium and Umeclidinium) • Renal impairment (Tiotropium, Umeclidinium, and Glycopyrronium) • Urinary retention (Aclidinium and Glycopyrronium) • Severe hypersensitivity to milk proteins (Aclidinium and Glycopyrronium)	
Tiotropium (Spiriva® Respimat 2.5mcg/inhalation) ≥18 years old	2.5 mcg 2 inhalations once daily Note: Can use tiotropium in children ≥6 years if asthma is not well controlled with medium or high dose ICS-LABA (GINA 2024)
Umeclidinium (Incruse® Ellipta 62.5mcg/puff) ≥18 years old	62.5 mcg 1 puff once daily

LAMA + LABA + ICS **(Long-Acting Muscarinic Antagonist/Long-Acting Beta Agonist/Inhaled Corticosteroid)**	
Contraindications • Narrow angle glaucoma • Urinary retention • Severe hypersensitivity to milk proteins (dry powder inhalers only) • Renal impairment • Status asthmaticus • Close monitoring is warranted in patients with a change in vision or with a history of increased intraocular pressure, glaucoma, and/or cataracts	
Fluticasone furoate + Umeclidinium + Vilanterol (Trelegy® 200mcg/62.5mcg/25 mcg) ≥18 years old	100-200 mcg 1 inhalation daily
Mometasone + Glycopyrronium + Indaceterom (Enerzair® 160mcg/50mcg/150mcg) ≥18 years old	Contents of one capsule inhaled via Breezhaler device once daily

**Includes dosing guidelines per Canadian Pediatric Society ICS recommendations, (Oct 2021), accessed February 2025*

Appendix 4: Initiating Treatment for COPD

Order Treatment Table for New and Established Cases of COPD- GOLD Adapted from GOLD 2024 guidelines and recommendations, accessed February 2025	
GOLD Group A	
Symptoms:	• 0 or 1 moderate exacerbations (not leading to hospitalization) • CAT <10 • mMRC 0 ("I only get breathless with strenuous exercise") or 1 ("Dyspnea when hurrying or walking up a slight hill")
Treatment: SABA, SAMA, LABA, **OR** LAMA	
GOLD Group B	
Symptoms:	• 0 or 1 moderate exacerbations (not leading to hospitalization) • CAT >=10 • mMRC ≥ 2 ("I walk slower than people of the same age on the level because of breathlessness" or "I have to stop for a breath when walking at my own pace on the level")
Treatment: LABA/LAMA	
GOLD Group E	
Symptoms:	• ≥ 2 moderate exacerbations or ≥ 1 severe exacerbation(s) leading to hospitalization
Treatment: LABA/LAMA *Consider LAMA+LABA+ICS if blood eosinophils ≥ 300 cells/microliter	

Order Treatment Table for New and Established Cases of COPD- CTS

Adapted from Canadian Thoracic Society (CTS) 2023 recommendations, accessed February 2025

Patients are considered to be at:

- Low-risk of exacerbations: ≤1 moderate (moderate = prescribed antibiotic and/or oral corticosteroids) exacerbation in the last year and did not require an emergency department visit or hospitalization
- High-risk of exacerbations: ≥2 moderate or ≥1 severe exacerbation in the last year (severe = requiring a hospitalization or emergency department visit)

The levels of exacerbations severity are:

- Mild- worsening or new respiratory symptoms without a change in prescribed medication
- Moderate- requiring prescribed antibiotic and/or oral corticosteroids
- Severe- requiring a hospital admission or emergency department visit

MILD—Low Symptom Burden

Symptoms:

- At low risk of exacerbations
- CAT <10
- mMRC ≤1
- FEV1≥80%

Treatment: LABA **OR** LAMA

MODERATE or SEVERE—Low AECOPD Risk

Symptoms:

- At low risk of exacerbations
- CAT ≥10
- mMRC ≥ 2
- FEV1≤80%

Treatment: LAMA/LABA

*If impaired lung function (FEV1 <80% predicted) despite LAMA/LABA dual therapy or ICS/LABA combination therapy increase to a LAMA + LABA + ICS

Note: LAMA/LABA dual therapy is preferred to ICS/LABA combination therapy due to significant improvement in lung function and lower rates of pneumonia. However, ICS/LABA combination therapy is preferred to LAMA/LABA dual therapy in individuals who have COPD and concomitant asthma

MODERATE or SEVERE—High AECOPD Risk

Symptoms:

- At high risk of exacerbations
- CAT ≥10
- mMRC ≥ 2
- FEV1≤80%

Treatment: LAMA+LABA+ICS

*If impaired lung function (FEV1 <80% predicted) despite LAMA/LABA/ICS triple combination therapy, consider addition of Prophylactic macrolide / PDE-4 inhibitor / mucolytic agents

Per Order Treatment Tables for New and Established Cases of COPD above—provide prescription for 1 inhaler with 1 repeat	
SABA (Short-Acting Beta Agonist)	
Contraindications • Hypersensitivity to medication or any component of the formulation • Tachyarrhythmia	
Salbutamol (Ventolin® pMDI 100mcg)	1-2 puffs every 4 hours PRN, up to 8 puffs/day
Terbutaline (Bricanyl® Turbuhaler 0.5mg)	1inhalation every 4-6 hours PRN, up to 6 inhalations/day
SAMA (Short-Acting Muscarinic Antagonist)	
Contraindications • Hypersensitivity to medication or any component of the formulation	
Ipratropium (Atrovent 20mcg)	2 puffs TID-QID (Max dose: 240mcg/12 puffs daily, no less than 4 hours apart)
LAMA (Long-Acting Muscarinic Antagonist)	
Contraindications • Glaucoma • Prostatic hyperplasia or bladder neck obstruction (Tiotropium and Umeclidinium) • Renal impairment (Tiotropium, Umeclidinium, and Glycopyrronium) • Urinary retention (Aclidinium and Glycopyrronium) • Severe hypersensitivity to milk proteins (Aclidinium and Glycopyrronium)	
Tiotropium (Spiriva® Handihaler 18mcg)	Contents of 1 capsule inhaled via HandiHaler device DAILY
Tiotropium (Spiriva® Respimat 2.5mcg)	2 inhalations DAILY
Umeclidinium (Incruse® Ellipta 62.5mcg)	1 puff DAILY
Glycopyrronium (Seebri® 50mcg)	Contents of one capsule inhaled via Breezhaler device DAILY
Aclidinium (Tudorza® 400mcg/inhalation)	1 inhalation BID

LAMA/LABA Dual Bronchodilator (Long-Acting Muscarinic Antagonist/Long-Acting Bata Agonist)	
Contraindications • Narrow angle glaucoma • Urinary retention • Severe hypersensitivity to milk proteins (dry powder inhalers only) • Renal impairment	
Tiotropium + Olodaterol (Inspiolto® Respimat 2.5/5 mcg)	2 inhalations DAILY
Umeclidinium + Vilanterol (Anoro® Ellipta 62.5/25mcg)	1 puff DAILY
Aclidinium + Formoterol (Duaklir® Genuair 400mcg/12mcg)	1 puff BID
Indacaterol + Glycopyrronium (Ultibro® Breezhaler 110mcg/50mcg)	Contents of 1 capsule inhaled via Breezhaler device DAILY
LAMA+LABA+ICS (Long-Acting Muscarinic Antagonist/Long-Acting Beta Agonist/Inhaled Corticosteroid)	
Contraindications • Narrow angle glaucoma • Urinary retention • Severe hypersensitivity to milk proteins (dry powder inhalers only) • Renal impairment • Status asthmaticus • Close monitoring is warranted in patients with a change in vision or with a history of increased intraocular pressure, glaucoma, and/or cataracts	
Fluticasone furoate + Umeclidinium + Vilanterol (Trelegy® 100mcg/62.5mcg/25 mcg)	1 inhalation DAILY
Budesonide + Glycopyrrolate + Formoterol fumarate (Breztri® 160mcg/9mcg/4.8 mcg)	2 puffs BID