

Requesting Organization: NYU-Winthrop Hospital



NYU-Winthrop Hospital
Division of Allergy and Immunology
120 Mineola Blvd, Suite 410
Mineola, NY 11501
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Pfizer Independent Grants for Learning and Change

Invited Full Proposal following Letter of Intent(LOI)
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Title:

Improvement of documentation of the Total Steroid Burden and education of steroid effect in Atopic Dermatitis with the use of a simplified EMR tool

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Title:

Improvement of documentation of the Total Steroid Burden and education of steroid effect in Atopic Dermatitis with the use of a simplified EMR tool

Abstract and Background Information:

Atopic dermatitis (AD) is a common, chronic allergic-dermatologic disorder affecting up to 10-20% of children and 1-3% of adults, with an estimated economic impact of up to \$3.8 billion dollars per year.¹⁻² Corticosteroids are judiciously used in the medical arena for various disease processes, especially in disorders of “atopy.”³ Allergists and immunologists, dermatologists, and primary care physicians prescribe several types of corticosteroids (topical, intranasal, inhaled, and systemic) and some patients may self-treat with topical or intranasal corticosteroids. This is common especially since many of these steroid preparations are available over the counter to treat protean conditions including atopic dermatitis, eczema, rhinitis, and asthma. Moreover, there is data suggesting that AD patients may be over-prescribed high potency topical as well as systemic corticosteroids.⁴ However, monitoring of the total steroid burden is usually considered cumbersome, and its importance is often overlooked by both the patient and the practitioner. As such, side effects, subtle and obvious, local and systemic are not monitored.³ The education of patients as well as caretakers of pediatric patients with AD is highly recommended to decrease health care associated costs and improve the overall delivery of health care and quality of life in this patient population.⁵⁻⁶

The overall goal of this QI project for AD patients is to complete clinical practice utilization of a monitoring tool for total steroid burden (systemic, cutaneous, intranasal and inhaled) with appropriate and compliant health record documentation. This monitoring tool was recently published by members of our Allergy/Immunology group.³

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C. Main Section of the proposal

Project Classification:

This proposed initiative best represents a Quality Improvement and Patient Safety(QI/PS) project in our Division of Allergy and Immunology at NYU-Winthrop Hospital. Our institution maintains an educational subscription to the Institute for Healthcare Improvement (IHI) Open School learning curriculum In Quality Improvement and Patient Safety through our Graduate Medical Education department which our resident and fellow physicians complete online.

We will utilize the following IHI Model for Improvement Principals in the development, implementation, and monitoring of this project: **(1)** Patient Safety (Teamwork and Communication in a Culture of Safety); **(2)** Patient Focused Care (Seeing Care Through the Eyes of Patients and Families); **(3)** Quality Improvement (How to Improve with the Model for Improvement, Leading Quality Improvement, and Planning for Spread: from local improvements to system-wide change).

We will structure the QI work using the Plan-Do-Study-Adjust (PDSA) methodology over two linked 1-year improvement cycles.

1. Overall Goals and Objectives:

The overall goals of this QI project for AD patients are: **(1)** Complete clinical practice utilization of a monitoring tool for total steroid burden (systemic, cutaneous, intranasal and inhaled) with appropriate and compliant health record documentation. This monitoring tool was recently published by members of our Allergy/Immunology group.³ **(2)** Included in this tool and based on the reported steroid use, review of related adverse effects with the patient and/or caretaker will be documented, aiming to enhance their education, awareness and disease-specific health literacy. **(3)** We aim to achieve improvements in patient health outcomes. Based on the result of the tool, we will monitor adjustments made by the provider on the steroid use of the patient. We will specifically monitor safety (decreased side effects) and efficacy. **(4)** We will promote increased clinician awareness of the utility and practicality of use of this monitoring tool for their practice using publication, hands-on precepting of the tool, and didactic sessions. **(5)** We will extend the project to our primary care practices. Thus we utilized the IHI Model for Improvement Principals in the development of an electronic version of the current tool, implementation in our practice, and monitoring for efficacy and practicality. We expect that our practice will use this tool at each patient encounter for asthma, allergic rhinitis, eosinophilic esophagitis patients for total steroid burden. **(6)** We aim to overcome barriers to effective education, patient comprehension, and clinical documentation and how to best take action in overcoming these issues for the success of quality improvement. The stated goals of this QI project align with the focus of the RFP, as the over-arching goal is to improve patient healthcare outcomes via on-going comprehensive medication evaluations and collaborative education through the physician-patient relationship. Overall, if useful, we would like to make this a standard of care for any physician who is prescribing corticosteroids including for asthma, allergic rhinitis, eosinophilic esophagitis and other eczemas. We aim to improve Total Steroid Burden documentation from the current rate of zero to 50% over the two year cycle.

Current Assessment of need in the target area

We aim to increase documentation of total steroid burden of our patients, steroid side effects, patient education based on completed monitoring tools by 50% over 24 months, from 75 patient encounters per year on average, to 300 or more patient encounters by the project's conclusion. Through a billing/patient log query, we will identify our patient population and review charts to assure EMR documentation of:

- 1) All steroid use and side effects **before** the use of the monitoring tool;
- 2) All steroid use and side effects **after** the use of the monitoring tool;
- 3) All patient counseling about prescribed steroid risk and benefits and/or side effects, if any.

We currently do not have a standardized method of documenting the total steroid burden in our outpatient EMR, and we intend to validate the paper-based tool for extended use in informatics setting.

Target Audience:

The primary population targeted for this project is patients with AD evaluated and followed by physicians in our out-patient allergy practice, including both infant/children and adolescent/adult patient populations. For our pediatric patients and cognitively impaired adult patients, their parent(s)/adult caretaker(s) also represent a target audience for this project. All of our new and established patients with AD could represent our sample population for this QI study. In our office, we follow about 300 patients of various ethnic and socioeconomic backgrounds with AD. Many of these patients also have asthma and allergic rhinitis and are prescribe or take other forms of corticosteroids.

Project Design and Methods:

This monitoring tool will be used at each encounter of the AD patient. Using a modified version of our Electronic Health Record (EHR) system, we will measure the differences in steroid burden documentation among AD patients of varying severity as well as the changes in steroid burden in our patients over time (with medication reconciliation, disease exacerbation and/or disease improvement/remission(s)). Based on responses on the monitoring tool, our allergist/immunologists will provide education. We will monitor the baseline and expected increase in the number of patient education encounters over time. We will also assess the health outcome perceptions of the patient and/or caretaker as a result of this education through questionnaire/surveys. We will measure the utility and validity of our monitoring tool by collecting healthcare provider feedback, using a Physician Satisfaction Survey that will measure physician satisfaction, educational efficacy, and impact on length of patient visit.

Innovation: We have conducted an electronic literature search via Google Scholar and PubMed. There are several publications involving quality improvement initiatives in AD, but none that we found in our search, which assesses the total steroid, burden as described above. This project does build upon existing work in our Division of Allergy and Immunology at NYU-Winthrop Hospital, as we have published a peer-reviewed article extensively reviewing the local and systemic adverse effects of corticosteroid preparations.³

Evaluation and Outcomes:

(1) We will conduct baseline measure for the documentation of total steroid medication burden and available monitoring tools, as described in the section above. We will collect the data through real-time, on-going reviews of the total steroid medication burden in our AD patients, which will be documented in the EMR record, communicated to the patient verbally, and in writing on a pre-formed template.

(2) We will use quantitative, objective data points (total steroid burden documentation, side effect monitoring, changes done due to monitoring tool). We will provide counseling to the patient and/or caretaker regarding the effects of the steroid medications and determine patient satisfaction with the process

(3) We will assess physician perception of usefulness, value and time spent as well as subjective points (ease of data collection , educational value and provider satisfaction), measured via a ranking scale questionnaire. Baseline measures and changes in patient-level quantitative outcomes (such as total steroid burden) over time will be summarized via raw counts (%), means (standard deviation), and medians (with interquartile range), as appropriate. Below is an example of the paper-based Physician Satisfaction survey, which will be collected from all participating project clinicians on a monthly basis

Physician Survey example

Please rate your experience of using the Total Steroid Burden Monitoring Tool within the EHR

Variable	Response Categories			
Physician satisfaction with the tool	Extremely satisfied	Satisfied	Dissatisfied	Extremely dissatisfied
Ease of data collection using the tool	Extremely satisfied	Satisfied	Dissatisfied	Extremely dissatisfied
Value of Screening information obtained by the tool	Extremely useful	useful	Not useful	
Effect on visit time of using the tool	Decreased	Same	< 10 min	>10 min
Tool's Educational value to you as a clinician	Extremely Valuable	Somewhat valuable	Somewhat invaluable	Extremely invaluable

(4) We currently have no standardized method of quantifying the total steroid burden or providing patient education on this topic so we expect a significant amount of practice change as a result of this QI project.

(5) We will disseminate the project outcomes via both local and national conference presentation (i.e. NYU-Winthrop Research Day, LIAAS, ACAAI, AAAAI) and via peer-reviewed publication. If validated and user-friendly, this tool can be used for asthma and allergic rhinitis patients as well.

Detailed Workplan and Deliverables Schedule

Anticipated Project Timeline: We anticipate that this QI project will have a timeline of approximately 2 years duration. The QI methodology to be used will consist of two-linked PDSA cycles, staged as follows:

Tool: Steroid Burden Monitoring Tool

Step: MDs performing tool

PDSA Cycle 1:

We will show all physicians demonstration of our steroid burden monitoring tool during Wednesday afternoon conference time. We will ask our workflow representative to be present to explain details of the process. We will test the form and ask for physician feedback on usability.

PDSA Cycle 2:

We will process map and make this a multidisciplinary approach. The medical assistants will use the EMR to enter the data. The physician will be verifying medications and side effects and then counseling the patients.

An initial reminder is needed for physicians to complete the steroid burden monitoring tool.

Description of current EMR workflow

Office Practicum software was originally designed in 1992 and now currently serves as our all-in-one software with billing and a practice management system. The system offers appointment scheduling, clinical documentation management, comprehensive exam room functionality and billing. Key features include medication history checking, several growth chart options, patient chart showing hyperforms, as well as pre-made templates.

Description of modification to EMR workflow for this project

Informatics staff members will modify the medication and history screens of the EMR to capture the steroid burden screening variables during the clinical visit. The resulting workflow is illustrated below

Illustrations of proposed EMR workflow modification

This project is designed to introduce an EMR modification that will be user friendly and comprehensive, and will capture data that will lead to improved patient care. The user is prompted to inquire about the medication use and ask or document possible adverse effects of corticosteroids.

The prompts will be inserted in medication history screen for four types of corticosteroids:

- (1) Cutaneous CS**
- (2) Inhaled CS**
- (3) Intranasal CS**
- (4) Systemic CS**

The prompt enables user to ask the appropriate question and enter data. As well it increases the clinicians knowledge of the total burden of corticosteroid, information that may not have been captured if patient is presenting with a specific disease (i.e. atopic dermatitis but also has

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allergic rhinitis) and/or using over the counter medications that is not documented in their medication list. Changes based on this information will be documented in the counseling section. Illustrations of these prompts, as well as Pediatric Growth Chart, Plan of Action, and Counseling screen prompts, follow this section.

Illustration of the Cutaneous CS monitoring screen:

The screenshot displays the 'Allergy Note Capture' window. At the top, patient information for 'Fonacier Test' is shown, including DOB (01-Jan-1990), Gender (Female), and address (120 Mineola Blvd Mineola NY, 11501). Below this, a toolbar contains various icons for patient management. The main area shows a list of steroid classes for monitoring, with 'Cutaneous CS' selected. Arrow A points to the 'Cutaneous CS' section, which lists various steroid classes and their associated side effects. Arrow B points to the 'Side Effect Monitoring' section, which includes checkboxes for 'Telangiectasia', 'Atrophy', 'Striae', 'Hair growth', 'Pigment changes', and 'Rosacea'.

A → **Cutaneous CS**

- Class 1: Super Potent: Fluocinonide [Vanos C (0.1%)]
- Class 2: High Potency: Amcinonide, Desoximetasone [Topicort C/O/G (0.25%, 0.05%)]
- Class 3: Upper Mid: TCI acetonides [Kenalog (0.5%)] TCI Diacetate, BTM 17 valerate, BTM DP
- Class 4: Mid Potency: Desoximetasone [Topicort LP C/O (0.05%)] HC 17-butyrate [Westcort O (0.2%)]
- Class 5: Lower Mid Potency: Flurandrenolide, Fluticasone Pro [Cutivate D (0.05%)]
- Class 6: Low Potency: Acetometasone DP [Aclovene C/O (0.05%)]
- Class 7: Least Potent: Hydrocortisone

B → **Side Effect Monitoring:** Telangiectasia Atrophy Striae Hair growth Pigment changes Rosacea Easy bruising

Arrow A allows user to select **topical corticosteroid** the patient is on. Includes

1. Steroid used
2. Number of days used the past 4 weeks
3. The number of applications per day

Arrow B allows user to enter side effects present (green) or absent (red)

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Illustration of the Inhaled CS monitoring screen:

Test, Fonacier Chart 146249 - Internet Explorer

Fonacier Test DOB 01-Jan-1990 (27y) IDX # [None] Gender Female

do not leave message at home

120 Mineola Blvd Mineola NY, 11501 Phone (h) 516-663-9300

SN N/S Last None PCP TSE Ref Ins Phm CVS/pharmacy #...

Encounter 9/25/2017 1:41 PM with Luz Fonacier, MD at 120 Mineola for not specified

Status [none] Room [none] Note [None] Charge Slip Status [None]

Patient Summary History Progress Notes Labs Radiology Other Tests All Orders Immunizations Procedures Correspondence Student Note Messages Misc.

Demo/Ins. Active Items MA Medications I-STOP Handouts Allergy Immunotherapy Infusion Rheum All Documents Health Maintenance Clinical Summary

***Allergy Note Capture**

Save Save and Close Preview Create and Edit Create and Finalize Create Options

Urticaria Urticaria Activity Score ACT (ADULT) ACT (CHILD) Autosaved 6 minutes ago

Inhaled CS +/- LABA

BCL DP [Qvar 40mcg] [Qvar 80mcg] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Budesonide [Pulmicort Flexhaler 90mcg] [Pulmicort Flexhaler 180mcg] [Budesonide Respules 0.25mg] [Budesonide Respules 0.50mg] [Budesonide Respules 1.0mg] [Symbicort 80/4.5] [Symbicort 160/4.5] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Ciclesonide [Alveso 80mcg] [Alveso 160mcg] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Flunisolide [Aerospan 80mcg] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Fluticasone Furoate [Arnuity Diskus 100mcg] [Arnuity Diskus 200 mcg] [Breo Ellipta 100/25] [Breo Ellipta 200/25] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Fluticasone Propionate [Flovent HFA 44mcg] [Flovent HFA 110mcg] [Flovent HFA 220mcg] [Flovent Diskus 50mcg] [Flovent Diskus 100mcg] [Flovent Diskus 200mcg] [Advair Diskus 100/50] [Advair Diskus 250/50] [Advair Diskus 500/50] [Advair HFA 45/21] [Advair HFA 115/21] [Advair HFA 230/21] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Mometasone [Asmanex Twisthaler 110mcg] [Asmanex Twisthaler 220mcg] [Asmanex HFA] [Dulera 100/5] [Dulera 200/5] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Triamcinolone [Azmacort] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Umeclidinium [Anorol] Average total puff/day the past 4 weeks: 1 puff 2 puffs 3 puffs 4 puffs

Side Effect Monitoring: Candidiasis Hoarseness/dysphonia Cough Perioral dermatitis

Bad taste in the mouth

Another drop down box is if the patient is also on **inhaled corticosteroid**

Arrow C allows the user to select the specific inhaled steroid of the patient and the dosage

Arrow D is side effect monitoring for inhaled corticosteroid.

A separate box for "write in" is available in any area where a triangle is seen(**Arrow B**).

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Illustration of the Intranasal CS monitoring screen:

The screenshot displays the 'Allergy Note Capture' window in a medical software interface. The patient information at the top includes 'Fonacier Test', DOB 01-Jan-1990 (27y), Gender Female, and address 120 Mineola Blvd Mineola NY, 11501. The 'Intranasal Steroid' section lists various options with their dosages and spray counts. An arrow labeled 'E' points to the 'Intranasal Steroid' section, and an arrow labeled 'F' points to the 'Side Effect Monitoring' section.

Intranasal Steroid Options:

- Beclometa-one [Q Nasal] . Total sprays in both nostrils per day: 1 spray 2 sprays 3 sprays 4 sprays
- Budesonide [Rhinocort] . Total sprays in both nostrils per day: 1 spray 2 sprays 3 sprays 4 sprays
- Ciclesonide [Zetonna] . Total sprays in both nostrils per day: 1 puff 2 puffs 3 puffs 4 puffs
- Fluticasone [Nasare] . Total sprays in both nostrils per day: 1 spray 2 sprays 3 sprays 4 sprays
- Fluticasone Furoate [Veramyst] . Total sprays in both nostrils per day: 1 spray 2 sprays 3 sprays 4 sprays
- Fluticasone Propionate [Flonase] . Total sprays in both nostrils per day: 1 spray 2 sprays 3 sprays 4 sprays
- Mometasone [Nasonex] . Total sprays in both nostrils per day: 1 spray 2 sprays 3 sprays 4 sprays
- Triamcinolone [Nasacort] . Total sprays in both nostrils per day: 1 spray 2 sprays 3 sprays 4 sprays

Side Effect Monitoring: Nose bleed Mucosal atrophy Ulceration Perforation Throat irritation Nasal dryness Burning/stinging Perinasal dermatitis

Another drop down box is if the patient is also on **intranasal cortocosteroid**
Arrow E allows user to choose intranasal steroid used and dosage
Arrow F is for side effect monitoring

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Illustration of the Systemic CS monitoring screen:

Test, Fonacier Chart 146249 - Internet Explorer

Fonacier Test DOB 01-Jan-1990 (27y) IDX # [None]
do not leave message at home Gender Female
120 Mineola Blvd Mineola NY, 11501 Phone (h) 516-663-9300
SN N/S Last None PCP TSE Ref Ins Phm CVS/pharmacy #... 0

Encounter 9/25/2017 4:08 PM with Luz Fonacier, MD at 120 Mineola for not specified
Status [none] Room [none] Note [None] Charge Slip Status [None]

Patient Summary History Progress Notes Labs Radiology Other Tests All Orders Immunizations Procedures Correspondence Student Note Messages Misc.
Demo/Ins. Active Items MA Medications I-STOP Handouts Allergy Immunotherapy Infusion Rheum All Documents Health Maintenance Clinical Summary

*Allergy Note Capture

Save Save and Close Preview Create and Edit Create and Finalize Create Options

+ Steroid Burden/Cutaneous + Steroid Burden/Inhaled CS+/-LABA + Steroid Burden/Intranasal Steroid + Steroid Burden/Systemic CS (Oral, IM, IV, lesional, articular)

Systemic CS (Oral, IM, IV, lesional, articular)

Prednisone Average total dose per course: 175 mg . # of courses the past year: 2

Prednisolone Average total dose per course: . # of courses the past year:

Methyl Pred . [Medrol] . Average total dose per course: . # of courses the past year:

Dexamethasone . [Decadron] . Average total dose per course: . # of courses the past year:

Hydrocortisone-21-acetate Average total dose per course: . # of courses the past year:

HC sodium . [Solu-cortef] . Average total dose per course: . # of courses the past year:

Cloprednol Fludrocortisone Acetate . [Florinef] . Average total dose per course: . # of courses the past year:

Triamcinolone Average total dose per course: . # of courses the past year:

BTM Sodium phosphate . [Celestone] . Average total dose per course: . # of courses the past year:

Side Effect Monitoring Growth chart (child) Bone mineral density Weight gain Moon facies Infection
Cataract Intraocular pressure Sleep disturbance Mood change HPA axis evaluation

This drop down box will be used if the patient is receiving or has received **systemic cortocosteroid the past year**.

Arrow G allows user to choose systemic steroid use and dosage

Arrow H is for side effect monitoring both in children and in adult

Arrow I: The Growth Chart for children is a pull down from the main menu, a sample is attached below.

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Illustration of [Plan of Action](#) screen:

Test, Fonacier Chart 146249 - Internet Explorer

Fonacier Test DOB 01-Jan-1990 (27y) IDX # [None] Gender Female

do not leave message at home

120 Mineola Blvd Mineola NY, 11501 Phone (h) 516-663-9300

SN N/S Last None PCP TSE Ref Ins Phm CVS/pharmacy #...

Encounter 9/25/2017 1:41 PM with Luz Fonacier, MD at 120 Mineola for not specified

Status [none] Room [none] Note [None] Charge Slip Status [None]

Patient Summary History Progress Notes Labs Radiology Other Tests All Orders Immunizations Procedures Correspondence Student Note Messages Misc.

Demo/Ins. Active Items MA Medications I-STOP Handouts Allergy Immunotherapy Infusion Rheum All Documents Health Maintenance Clinical Summary

*Allergy Note Capture

Save Save and Close Preview Create and Edit Create and Finalize Create Options

+ Fiberoptic Rhinolaryngoscopy + Skin Biopsy Autosaved 8 minutes ago

Plan Carry Forward

Click to add the following problem specific plans: + Acute Sinusitis + Asthma

Labs were ordered as noted to monitor high risk medications to evaluate disease state for diagnostic evaluation

Diagnostic exams were ordered as noted to evaluate disease state for diagnostic evaluation Bone density

Discussed in detail features of patient's diagnosis and counseled patient on options for treatment of this disease

Obtain Patient's Previous Record

Counseling Points Carry Forward

Counseling provided regarding dust mite avoidance measures aeroallergen control measures Epi Pen or Twin Ject administration asthma treatment and use of MDI food avoidance

Family Engagement Strategy: action plan and medical use (epipen/inhaler) reviewed, demonstrate appropriate use

Arrow J: Based on the patient's steroid burden, a plan of action can be done (Labs requested, bone density etc will be documented here)

This will lead to **Arrow K** for counseling

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Illustration of the Counseling screen:

The screenshot displays the 'Allergy Note Capture' window within a medical software interface. The window title is '*Allergy Note Capture'. It features a toolbar with buttons for Save, Save and Close, Preview, Create and Edit, Create and Finalize, Create, and Options. Below the toolbar, there are several expandable sections. The 'Corticosteroid Burden Counseling' section is expanded, showing options for Cutaneous, Inhaled, Intranasal, and Systemic treatments, each with buttons for 'Decrease dose', 'Increase dose', 'Decrease potency', 'Increase potency', 'Discontinue', 'Monitor', and 'Other'. The 'Patient counseled' section is also expanded, showing a 'Yes' button and a 'No' button. Below this, there is a 'Patient satisfaction with process' section with buttons for 'Extremely satisfied', 'Satisfied', 'Equivocal', 'Dissatisfied', and 'Extremely dissatisfied'. The 'Patient Education' section is also expanded, showing options for 'Literature Provided', 'Asthma Action Plan', and 'Emergency Care Plan'. The 'Follow Up' section is expanded, showing a 'No follow up appointment is required. Please call the office if needed in the future.' button and a 'Follow up appointment in' section with dropdowns for 'day(s)', 'week(s)', and 'month(s)'. The 'Follow up in the' section has dropdowns for 'spring', 'summer', 'fall', and 'winter'. A blue arrow labeled 'L' points to the 'Patient counseled' section.

The counselling window carries the physician to the course of action. We will monitor changes done based on the information gathered from this tool.

Arrow L: Included are information as to whether the patient/parent was counseled on the risk and benefits of their treatment regimen and the patient satisfaction.

D. References

¹Schneider L, Tilles S, Lio P, et al. Atopic dermatitis: a practice parameter update 2012. J Allergy Clin Immunol. 2013 Feb;131(2):295-9.

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⁶Ahrens B, Staab D. Extended implementation of educational programs for atopic dermatitis in childhood. Pediatr Allergy Immunol. 2015 May;26(3):190-96.

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